INFRA STRUCTURAL DEVELOPMENT AND ECONOMIC GROWTH IN INDIA : PROBLEMS AND PROSPECTS

(ABSTRACT)

THESIS

SUBMITTED FOR THE DEGREE OF

Doctor of Philosophy

in

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By

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UNDER THE SUPERVISION OF

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ALIGARH MUSLIM UNIVERSITY
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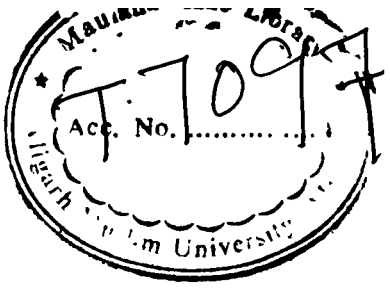
ABSTRACT



India is the second largest country in the world in terms of population and the seventh largest in term of area. With the exception of China, India has the largest consumer market in the world. India is the largest democracy in the world in terms of population. It has a parliamentary system of Govt. with center and state legislatures. The central government has jurisdiction over defense, communication, currency and banking, railroads and air traffics, international trade and foreign affairs. However, recently there is privatization of public sectors undertakings, air transport, banking, communication, oil exploration and electric power. The state governments have the primary responsibility for matters like education, health, local administration, agriculture etc. India is rich in natural resources, having most of the raw materials needed for industry.

India's economy is in a process of fast development. It is now ranked as the tenth largest industrial nation in the world. India has a mixed economy in which both the state and the private sector have specific roles to play.

Infrastructure is a necessary although not sufficient pre-condition for growth. Adequate quantity and reliable supply of infrastructure are the key factors which determine the competitiveness of industries and standard of living of the people. Infrastructurally, India is in competition with the developed world. The availability of infrastructure may have a direct influence on the economy. For e.g. linking of a village by road and transport with a nearby urban center may lead to increased

employment to the rural people in the nearby urban center, increased wage at the village level due to non-availability of labor and enables the rural producer to transport his product to urban center where he can get a higher price.

For any economy to grow rapidly, development of infrastructure is very essential. It is a necessary condition for achieving sustained economic growth over a longer period of time. Unless the critical importance of infrastructure is understood, and the services like power, telecommunication, seaports, airports, railways and roads are developed to cope up with the needs of the rapidly growing industrial sector, it would be difficult to achieve the overall rapid growth in the GDP. The World Bank, selected infrastructure as the focal theme for the World Development Report in 1994 and examined the link between infrastructure and development. Huge researches in recent years have been devoted to link aggregate infrastructural spending and growth of GDP

There is an evolutional growth of infrastructure before independence. Railway, irrigation, post and telegraph sector were somewhat partially developed before independence. But after 1947, there are bright trends of infrastructure development. But it is not satisfactory. Since 1991, we concentrated in infrastructure development. But still there are many crucial problems.

After the New Economic Policy both private and foreign sectors are fully in the operation in the Indian economy. The matter is that infrastructure is still the responsibility of the government sector. The shortages of the infrastructure and lower rate of investment and underproduction of goods and services relating to infrastructure have become the main cause of concern for the economic

planners, thinkers and as well as economic administrators. Taking them into account government had constituted Rakesh Mohan Committee on infrastructure.

The government of India has been using the five year plans as a vehicle to address the concern of regional disparities in the country. One of the GOI's objectives was to improve the standard of living of the lowest 30 percent of the population, most of them living in backward areas. .

Till recently, the government of India had been providing maximum of all the above mentioned facilities. But of late, it has been realized that it would be extremely difficult for the government to pump in the required huge amounts of capita, particularly when the fiscal health of the government is also not too well. As a result, the government has moved away from the role of provider of infrastructural facilities to that of facilitator or regulator. Disparities in economic and social development across the regions and interstate disparities have been the major reasons for adopting planning in India since independence. Inter state economic and social disparities in India have been increasing in spite of various governmental measures to develop backward areas.

Infrastructure is still the responsibility of the government sector. The shortages of the infrastructure and lower rate of investment and underproduction of goods and services relating to infrastructure have become the main cause of concern for the economic planners, thinkers as well as economic administrators. Recognizing the importance of infrastructure in general and social and physical infrastructure in particulars in economic development and for the society as a whole, it is

essential to examine the degree of relationship between various components of social and physical infrastructure and GDP in India.

There is a crisis of infrastructure in our country. There is a need to search "economics of infrastructure in India". We adopted an economic path in which without infrastructure rapid and higher economic development is next to impossible. Economics of infrastructure should be treated as a separate and modern branch of economics. The economics of infrastructure deals with a school of thoughts namely economic and social infrastructure. Infrastructure deals with economic, social, and human development. As Indian circumstances, problems and prospects are quite different compared to other countries of the world, we need to study economics of infrastructure in Indian context. There are problems of finance, profitability, administrative hurdles, mismanagement, misdirected planning and implementation etc. there is a need to find out best alternative solution.

The development of an economy depends directly upon the availability of financial infrastructure facilities such as banking, insurance, etc. Banks facilitate in promoting the rate of savings and thereby help spending up the rate of capital formation. Different states are having the different levels of financial infrastructure which help in their economic development to a great extent.

In low income economies like India, innovative and diverse financing techniques like setting up of infrastructural development bank, creation of infrastructure bond, development of domestic capital market, privatization, promotion of

contractual savings etc., are needed to support an accelerating transition from public sector to private sector in the provision infrastructure sector.

As the government's ability to undertake investment in infrastructure is constrained, private participate has become necessary. But the transmission from public sector to private participation is not smooth. In my study I have attempted to describe the role of private sector as providers of infrastructure services in India. The objective is to study whether infrastructure provided by private sector is adequate or not to foster the rate of economic growth. Considering the profit motive of the private sector, there is no guarantee that the private sector would invest in infrastructure areas in future which are both risky and less profitable.

Therefore to produce efficiently, to export competitively and to use resources effectively, it is essential to improve the infrastructure sector. Many countries of the world have already introduced major infrastructure sector reform programs in the form of Privatization, Competition and Deregulation

Aligarh

September 25, 2008

Ruby Khan

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2008


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DEDICATED

TO

MY

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THESIS

Dated: September15, 2008

CERTIFICATE

This is to certify that the Ph.D. thesis entitled "INFRASTRUCTURAL DEVELOPMENT AND ECONOMIC GROWTH IN INDIA: PROBLEMS AND PROSPECTS"submitted by *Ms. Ruby Khan* has been completed under my supervision. This thesis is the original work of the researcher and is suitable for submission for the award of Ph.D. degree in Economics.

m. a Salam
(Md.Abdus Salam)
Supervisor

Acknowledgement

In the course of my work, I have benefited greatly from discussions with my supervisor. It's my pleasure to acknowledge my indebtedness to **Dr M. Abdus Salam** as my supervisor. I must express my deep sense of gratitude to the person who is a true guide. It is indeed a proud priviledge of having an opportunity to work with him.

I am grateful to **Prof. Abdul Wahab**, Chairman Department of Economics A.M.U.Aligarh, for his encouragement and cooperation.

As my work gets completed, I recall the assistance and encouragement provided by many people. I am thankful to the **library staff** of Seminar Library Department of Economics, A.M.U.Aligarh, Maulana Azad Library A.M.U.Aligarh, Library NCAER, New Delhi, Library NIPFP, New Delhi and Library ICSSR, New Delhi.

I shall be failing in my duty if I do not express my hearty gratitude to my husband, **Mohd Salm Kirmani**, for providing me valuable suggestions and moral support. I am heavily indebted to him for the numerous ways in which he has given me aid and counsel.

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September 15, 2008

Ruby Khan

Preface

For any economy to grow rapidly, development of infrastructure is very essential. It is a necessary condition for achieving sustained economic growth over a longer period of time. Unless the critical importance of infrastructure is understood, and the services like power, telecommunication, seaports, airports, railways and roads are developed to cope up with the needs of the rapidly growing industrial sector, it would be difficult to achieve the overall rapid growth in the GDP.

Therefore to produce efficiently, to export competitively and to use resources effectively, it is essential to improve the infrastructure sector. Many countries of the world have already introduced major infrastructure sector reform programs in the form of Privatization, Competition and Deregulation.

Till recently, the government of India had been providing maximum of all the above mentioned facilities. But of late, it has been realized that it would be extremely difficult for the government to pump in the required huge amounts of capita, particularly when the fiscal health of the government is also not too well. As a result, the government has moved away from the role of provider of infrastructural facilities to that of facilitator or regulator.

Infrastructure is still the responsibility of the government sector. The shortages of the infrastructure and lower rate of investment and underproduction of goods and

services relating to infrastructure have become the main cause of concern for the economic planners, thinkers as well as economic administrators. Recognizing the importance of infrastructure in general and social and physical infrastructure in particulars in economic development and for the society as a whole, it is essential to examine the degree of relationship between various components of social and physical infrastructure and GDP in India.

In the present study an attempt is made to explain about the reasons of ineffectiveness of investment of our country, the performances of different states in this field and the financial institutes who play a very important role in infrastructure financing.

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Ruby Khan

Contents

List of Tables

List of Figures

Abbreviations and Acronyms

ADB	Asian Development Bank
BOOT	Build Own Operator Transfer
CCS	Combined Component Scores
CMIE	Center for Monitoring Indian Economy
CPO	Cumulative Plan Outlay
CSO	Central Statistical Organization
CV	Coefficient of Variation
DFIs	Development Financial Institutions
DoT	Department of Telecommunication
ECAs	Export Credit Agencies
ECBs	External Commercial Borrowings
FIs	Financial Institutions
FOREX	Foreign Exchange
FY	Financial Year
GDI	Gross Domestic Investment
GDP	Gross Domestic Product
GOI	Government of India
ICICI	Industrial Credit and Investment Corporation of India
IDBI	Industrial Development Bank of India
IDFC	Infrastructure Development Finance Company
IESS	International Encyclopedia of Social Sciences

IFCI	Industrial Finance Corporation of India
IIFCL	India Infrastructure Finance Company Limited
IIFI	India Infrastructure Finance Initiative
IL&FS	Infrastructure Leasing and Financial Services Limited
IPOs	Initial Public Offers
LIC	Life Insurance Corporation
NAS	National Accounts Statistics
NDA	National Democratic Alliance
NH	National Highway
NHAI	National Highways Authority of India
NSDP	Net State Domestic Product
O&M	Operation and Maintenance
OYWS	Own Your Wagon Scheme
PCA	Principal Component Analysis
PCNSDP	Per Capita Net State Domestic Product
PFC	Power Finance Corporation
PFSBU	Project Finance Strategic Business Unit
PIDI	Physical Infrastructure Development Index
PLF	Plant Load Factor
PPPs	Public Private Partnerships
r	Coefficient of Correlation
REC	Rural Electrification Corporation
Rs	Rupees

SBI	State Bank of India
SD	Standard Deviation
SDP	State Domestic Product
SOC	Social Overhead Capital
SSI	Small Scale Industries
TPC	Tata Power Company
TRAI	Telephone Regulatory Authority of India
VAS	Value Added services
VSAT	Very Small Aperture Terminal
WDR	World Development Report

Chapter I

INTRODUCTION

- THE COUNTRY AND ITS RESOURCES
- THE INDIAN ECONOMY
- MEANING OF INFRASTRUCTURE
- TYPES OF INFRASTRUCTURE

  - *Physical Infrastructure*
  - *Social Infrastructure*
  - *Institutional Or Financial Infrastructure*

- INFRASTRUCTURE DEVELOPMENT REQUIRED FOR ECONOMIC GROWTH
- URBAN AREAS AND INFRASTRUCTURE DEVELOPMENT
- RURAL AREAS AND INFRASTRUCTURE DEVELOPMENT
- GOVERNMENT POLICY ON INFRASTRUCTURE DEVELOPMENT

  - *Infrastructure Development Finance Corporation (IDFC)*
  - *Airports*
  - *Ports*
  - *Power*
  - *Railways*
  - *Roads*
  - *Shipping*
  - *Telecommunication*

- STATEMENT OF THE PROBLEM
- SCOPE OF THE STUDY
- OBJECTIVES
- METHODOLOGY USED IN THE STUDY
- PERIOD OF THE STUDY
- SOURCES OF DATA
- LIMITATIONS
- PLAN OF THE STUDY
- REFERENCES

THE COUNTRY AND ITS RESOURCES

India is the second largest country in the world in terms of population and the seventh largest in term of area. With the exception of China, India has the largest consumer market in the world. India is the largest democracy in the world in terms of population. It has a parliamentary system of Government with center and state legislatures. The central government has jurisdiction over defense, communication, currency and banking, railroads and air traffics, international trade and foreign affairs. However, recently there is privatization of public sectors undertakings, air transport, banking, communication, oil exploration and electric power. The state governments have the primary responsibility for matters like education, health, local administration, agriculture etc.

India is rich in natural resources, having most of the raw materials needed for industry. Coal reserves are estimated at 1.25 billion tones and iron ore deposits are amongst the world's largest. India also has large deposits of high grade manganese ore lime stone and dolomite, all of which are essential for India's ever expanding steel industry. India's known reserves of petroleum are estimated at 470 million tones. Yet oil is not India's sole source of energy.

India continues to achieve remarkable progress in educating its population creating the third largest pool of scientific and technical personnel in the world. There is an abundance of both skilled and unskilled labor available at comparatively low wages, which is a vital factor for the growth and expansion of industry in the country.

Infrastructurally, India is in competition with the developed world. India's network of roads and railway system are amongst the largest in the world. In addition there are nine (9) international airports and 85 domestic terminals in the country. Air India, the official carrier provides service to over 50 countries. There are a number of private air taxies operators, providing air transport services to various destinations in India. In the direction of greater freedom, monopoly of Indian Airlines as the sole inland operator has been curtailed by repealing the Air Corporation Act, 1953. A number of private air taxi operators have acquired the status of private airlines.

India's commercial international banking facility is highly sophisticated. Aggregate deposits exceed Rs. 508 billion. Nearly all scheduled commercial banks are authorized by the Reserve Bank of India to undertake foreign exchange transaction.

India's well developed communication system includes international telephone service, teleprinters, telex, fax etc. The communication network has been assigned a high priority in India's development program.

These factors i.e., cheap labor, infrastructure facilities including communication, technical expertise, markets and new liberal policies of the government encouraging investment which are essential for the growth and development of industry provide excellent business opportunities to foreign investors, both in terms of investments and returns.

In addition, the fact that the official language of the government and business in English, is also considered a positive factor by foreign investors.

THE INDIAN ECONOMY

india's economy is in a process of fast development. It is now ranked as the tenth largest industrial nation in the world. India has a mixed economy in which both the state and the private sector have specific roles to play. India's five year plan has been formulated to set an order of priorities among public and private entities. The Eight five year plan for 1992 – 97 had envisaged rapid industrial development with an emphasis on technological dynamism and international competitiveness in selected sectors (e.g. steel, electronics, machine, and building). The emphasis is more on strategic and non-discretionary instruments of regulation.

Historically, the Indian economy was characterized as agricultural with few organized industries. India is now a leading industrial nation. Relying on its own resources it has recorded phenomenal industrial process and is now engaged in aiding the industrially less developed countries. Large investments continue to be made, enabling India to obtain technology and know how necessary in becoming a leading industrial power.

At the time of independence in 1947, India was importing even its basic requirements, including food. Today India produces a large variety of products varying from consumer goods to sophisticated electronic and electrical equipment, industrial machinery, machine tools, strips, aircrafts etc. India's achievements in the field of nuclear energy and space have won international recognition. India has set up joint ventures in a number of countries and

undertaken successfully several projects and contracts in Third World Markets independently or in cooperation with developed economies. Emerging Indian consultancy firms offer a complete range of services. With the radical improvement in the industrial climate, there exist even better prospects for industrial expansion.

MEANING OF INFRASTRUCTURE;

Infrastructure is a frequently used word, but there is no consensus in economic literature on its precise meaning. The term 'infrastructure' and 'social overhead capital' are often used interchangeably. In the international encyclopedia of social sciences (IESS), the SOC in 'narrow sense' refers to transportation, communication and power facilities. These are broadly the activities focused on by WDR. On the other hand IESS encompasses facilities such as education, health, maintenance of law and order, research etc, in the broad sense of SOC. These are the items generally included in the social sector in planning literature now a days. (Economic Survey)[1].

Lewis. W. A. (1955)[2] includes public utilities, ports, water supplies and electricity in the definition of infrastructure.

Hirschman, A. O. (1959)[3] lists facilities for law and order, education, public health, transportation, communications, power, water supply, irrigation and drainage. Higgins, B (1959)[4] includes transports, public utilities, school and hospitals. The 1994 World Development Report[(5)] also recognize infrastructure as an umbrella for many activities referred to as SOC .According to it , the

Infrastructure includes services from (i) Public utilities –power, telecommunication , piped water supply ,sanitation and sewage , solid waste collection and disposal and piped gas (ii) Public works – roads and major dam, and canals works for irrigation and drainage (iii) Other transport sectors – urban and interurban railways , urban transport , ports and waterways and airport.

Infrastructure is a necessary although not sufficient pre-condition for growth. Adequate quantity and reliable supply of infrastructure are the key factors which determine the competitiveness of industries and standard of living of the people. The availability of infrastructure may have a direct influence on the economy. For e.g. linking of a village by road and transport with a nearby urban center may lead to increased employment to the rural people in the nearby urban center, increased wage at the village level due to non-availability of labor and enables the rural producer to transport his product to urban center where he can get a higher price.

TYPES OF INFRASTRUCTURE:

The availability of adequate infrastructure is taken as the fundamental ingredient of development strategy. The availability of adequate transport facility, power, communication etc, is taken as essential precondition by any entrepreneur deciding on an investment project in any region. Similarly, the availability of skilled manpower and decent living condition is also important considerations in such location decisions. The concept of infrastructure has itself gone through changes over time. These changes reflect the deepening of the concept of

development and the process of economic development. There are three important aspects of the concept of infrastructure.

(1) **Physical Infrastructure:** - Physical infrastructure refers to a set of facilities without which an integrated, independent modern economy could not function. It is composed of transport, power, telecommunication, and irrigation, where transport again can be divided into four major sub-sectors like railways, roads, waterways and aviation. Physical infrastructural facilities directly help in the production process.

(2) **Social Infrastructure:** - The importance of human capital in the growth process is equally considerable as physical infrastructure. Human capital affects growth both through its changes on innovations and technological changes as well as increases in labor productivity. Social infrastructure is generally composed of health and educational indicators. This is a direct representation of the standard of living of the population which contributes to the income generating capability of the person concerned. Investments in the areas of health, education, water supply, housing etc. are included in it.

(3) **Institutional Or Financial Infrastructure:** - This highlights the importance of institutions of governance and regulations as well as of agencies which facilitate the flow of information and investible resources. The importance of administrative systems, legal mechanisms, and public safety has long been recognized as important preconditions to growth and development. Banks and financial institutions mobilize capital help in

reducing risk and can assist information flows regarding a number of economic actions.

Thus, users demand infrastructure services not only for direct consumption but also for raising their productivity. It generates such economic activities that serve both as input and output to the rest of the economy. The very nature of infrastructure is such that it cannot be imported in any complete product form. It creates service for the smooth functioning of the production process, starting from the firm to the aggregate national economic activity.

INFRASTRUCTURE DEVELOPMENT REQUIRED FOR ECONOMIC GROWTH

For any economy to grow rapidly, development of infrastructure is very essential. It is a necessary condition for achieving sustained economic growth over a longer period of time. The World Bank, selected infrastructure as the focal theme for the World Development Report in 1994 and examined the link between infrastructure and development. Huge researches in recent years have been devoted to link aggregate infrastructural spending and growth of GDP (Uchimura and Gao, 1993)[6]. Many of these studies have concluded that the role of infrastructure in growth is substantial, significant and frequently greater than that of investment in other forms of capital. Many other studies in the United States suggest that the impact of infrastructure investment on economic growth represents up to 60 percent rate of return. The nature and rate of growth of infrastructure determine the possibility of development of a country, diversification of production, expansion of trade, control of population growth, alleviation of poverty and

protection as well as improvement of conditions of environment. Creation and application of appropriate arrangements of facilities of infrastructure are needed for economic development and social upliftment.

URBAN AREAS AND INFRASTRUCTURE DEVELOPMENT:-

A large section of urban planners and policy makers believe that there are no serious urban problems in the country. On the other hand there exist a variety of solutions. All that is needed to restructure the system of governance is in a manner that these solutions can be implemented. Rapid population growth and low investment in urban development have created a serious deficiency in the availability of infrastructure and basic amenities in the towns and cities of the country. The rate of capital formation for this purpose has been extremely low during eighties.

The metropolitan and other large cities are expected to make capital investments, besides covering the operational costs for various infrastructural services. Most of the development projects are to be undertaken through institutional finance rather than budgetary support. Budgetary resources for meeting the growing demands of urban infrastructure are inadequate. Urban infrastructure is a state subject; however the Central Government provides policy guidelines for housing programs for target groups and supplements State Government efforts by assisting them in mobilizing institutional finance. A part from budgetary support extended by Central and State Governments, the major agencies involved in financing urban infrastructure are HUDCO, LIC and

infrastructure leasing and Financial Services Ltd. (IL$FS). HUDCO sanctioned Rs. 1678.67 crore for urban infrastructure schemes (as on October 31, 1999). Recently, HUDCO has taken a number of new initiatives for provision of urban infrastructura. It has promoted projects that are innovative in content and pioneering in nature that could be extensively replicated in other urban areas. HUDCO's recent major initiative has been to create a synergy between technology, finance and subsidy provided by various ministries, soft loans provided by financial institutions and technology promoters on a common platform through measures like single window clearance, joint appraisal and monitoring of projects.

RURAL AREAS AND INFRASTRUCTURE DEVELOPMENT:-

The major items of infrastructure as identified in the planning process include irrigations, power, transport, communication, education, health etc. Within these major heads, there are sub-items of rural infrastructure, which have direct bearing on agriculture development. For e.g. it is not only the availability of total power in the states, but equally important is its access to the villages and then to the agriculture. Similarly, source of irrigation is equally important as the irrigation itself. The major sub-items of infrastructure include –

(i) Proportion of villages electrified

(ii) Percentage of power used in agriculture.

(iii) Percentage of irrigated area.

(Iv) Intensity of tube wells.

(v) Density of rural roads.

(vi) Intensity of transport vehicles.

(vii) Fertilizer sale depot.

(viii) Rural credit as reflected by intensity of rural commercial banks.

(ix) Rural health as reflected by intensity of beds in rural hospitals.

(x) Rural infant mortality rate.

(xi) Intensity of wholesale markets.

(xii) Storage facilities

(xiii) Intensity of agricultural extension workers.

(xiv) Agricultural research/scientist.

If agricultural growth is to be stepped up, there is a need to raise investments in agriculture, especially in power, surface irrigation and rural roads, all of which are generally in the public sector domain and in the states sector. However public sector investments in Indian agriculture have been declining in real terms since 1980 – 81. Private sector investment in agriculture has been increasing, partly in response to improving terms of trade, but even this has slowed down in recent years. Parikh, K. S. (1997) [8] observed that in India states are in serious financial crises and there is urgent need to undertake major investments in social sectors and rural infrastructure but the states ability to undertake such investments have stagnated or declined. Private investment is not a substitute for public investment in all areas. Additional public investment in critical areas of agricultural and rural infrastructure is crucial and private investment would go up further once investment in such rural infrastructure picks up.

Thus, economic development and social upliftment are said to be ideal if there occurs simultaneously regional balance, sectoral balance and equitable distribution of income and wealth. Since nearly 80 percent population of India live in villages, there should be assignment of priority on creation and maintenance of infrastructure in villages. This will help complete transformation and development of rural society and economy. It will largely solve the problems and poverty unemployment and inadequate realization of minimum needs.

GOVERNMENT POLICY ON INFRASTRUCTURE DEVELOPMENT:-

After the new economic policy both foreign and private sectors are fully in the operation in the Indian economy. The matter is that infrastructure is still the responsibility of the govt. sector. The shortage of the infrastructure and lower rate of investment and underproduction of goods and services relating to infrastructure has become the main cause of concern for the economic planners, thinkers and as well as economic administrators. In a developing country like India, Infrastructural facilities are generally weak and inadequate. Many people, especially the rural poor, and areas do not have access to even minimal infrastructure services. If the nation aspires to attain maturity in economic growth, it must give a big push to the upliftment of the network of physical infrastructure like energy, transport etc. It is also observed that the economy could not grow and the needs of the people couldn't be met without more capacity in power, oil, telecom, railways, roads and ports. In view of the large financial requirements, the government acknowledges that the state and public investment have a

leading role to play in the development of infrastructure. The government of India appointed an expert group under the chairmanship of Rakesh Mohan to consider issues relating to commercialization of infrastructure projects which submitted its report in June 1996. The group has defined a role for private public participation in the required infrastructure and recommended that the government could adopt the venture capital route where the government and initially be the major share holder and upon completion and attaining viability of projects, it could disinvest and invest elsewhere. As a follow-up of the report, the infrastructure Development Finance Company (IDFC) has been set u to promote infrastructure investment with the central government and the Reserve Bank of India as chief contributors to its share capital (RBI 1996 – 97). The national Agenda for government, 1998 has also indicated infrastructural development as a thrust area particularly energy and power sectors for recommencing public expenditure in this sector, which would increase access to long term funds in the national and international markets, remove administrative bottlenecks and reserve the slowdown in this critical area of national economy. The adequacy of infrastructure in any sector is in terms of level of production and diversifying the sector. The experience across the world has shown the increase in stock of infrastructure is associated with the increase in output across the countries. As countries develop, infrastructure must adopt to support the changing patterns of demand as the share of power, roads, telecommunication in the total stock of infrastructure increases relative to the basic services such as irrigation etc.

India has a large and fairly well developed infrastructure framework extending to all parts of the country. However certain areas like power, telecommunication, transport etc. further expansion and modernization. And, the public sector alone can no longer fully finance the requirements. The 1998 – 99 Budget announced by the NDA government has given a major thrust to infrastructure development, particularly in energy and power, transport and communications, by stepping up public expenditure in these sectors. This increased government spending on infrastructure is expected to boost India's sluggish economy. The lack of a clear policy framework for private sector participation has hampered the badly-needed infrastructure development particularly in telecommunication, power, roads and ports. The public sector, which led the investment in infrastructure development until recently, has reduced its investments considerably, primarily due to its poor fiscal position.

IDFC:-

The established in 1997, is a specialized financial institution, set up to provide credit enhancement to infrastructure projects, and to extend long term loans and guarantees that existing institutions may not be able to provide. IDFC provides loans and guarantees worth dollars 17 million to five projects. The Asian Development Bank and the International Finance Corporation are shareholders for infrastructure projects have been developed by the IDFC and the Power Finance Corporation (PFC). At the state level, the PFC is primarily focused on public sector projects, while the IDFC concentrates on the private sector. In the

recent budget, the government proposed giving IDFC incentives and benefits available to other public financial institutions.

AIRPORTS:-

India currently has 5 international and 88 domestic airports. The annual growth rate in airline passenger traffic for the period 1997 – 2000 is expected to be about 7 percent for international travelers and 10 percent domestic, reaching a total of around 60 million passengers per year by the turn of the century. Along with this, air cargoes are expected to grow at least 12 percent annually to close to 506 million tons by 2000.

The air corporation Act, 1953, repealed on March 1, 1994 ended the monopoly o Indian Airlines and Air India over scheduled Air Transport Services. Private operators who were operating as air taxes, have been granted the scheduled airlines status. In addition, 21 air taxi operators have been given the permit for charter / non scheduled air transport services.

India's airports are in argent need of modernization in equipment and services, terminal, technologies and transport facilities. Specific investment opportunities include:

→ Expansion of import and export wings at international airports.

→ Building of new, integrated cargo and air freight terminals.

→ Building of common user domestic terminals at all international airports.

→ Introduction alleviating transfer vehicles with stacker systems.

→ Introduction of electronic data interchange at all airports to enable handing of international cargo.

PORTS:

India has 11 major ports in the country apart from 139 minor working ports along the coast line of 5550 km. India's 11 major ports, which account for over 90 percent of the country's port traffic, handled a record 251.44 million tons of cargo during IFY 1997 – 98, an increase of 10 percent over IFY 1996- 97, port traffic has been growing by 9 to 10 percent annually, and expected to reach 424 million tons by 2002. To decongest the ports a plan, with an outlay of Rs. 17000 cr., has been drawn in the 9th plan. It also aims to increase the major ports capacity to 424 million tons per annum from the existing 215.3 million tons.

To meet the huge gap between demand and availability of port capacity, private and foreign investment in ports is being encouraged by the government which issued guidelines liberalizing the sector in October 1996. As part of its port revival plan, the government has decided to lease outport assets to private companies at attractive terms to generate more revenue. Ministry of surface transport is also planning to incorporate the 11 major ports, and thus announced a port investment plan of dollars 7.6 billion for 21 projects in those major ports. Ports capacity is to be increased from the current level of 215 million tons to 850 million tons by 2012.

The guidelines approval for foreign investment has been liberalized to allow:

→ Automatic approval for foreign equity participation up to 74 percent in construction of ports and harbors.

→ Automatic approval for foreign equity participation up to 51 percent for support services such as operation and maintenance of piers, loading and discharging of vessels.

POWER:

The power sector is high on India's priority as it offers tremendous potential for investing companies based on the share size of the market and the returns available on investment capital. Since independence in 1947, the power generating capacity in India has increased over 59 fold, from 1362 mega watts (mw) to 8100 mw in 1995. Presently thermal plants account for 74 percent of total power generation, hydro electric plants for 24 percent and nuclear plants generate the remaining 2 percent. Currently approx. 85 percent of India's 560,000 villages have electricity and there is a nationwide network for the transfer and distribution of power to all parts of the country.

The central government has identifies a number of new initiatives to give a new thrust to the power sector. The government has agreed to set up a Power Trading Corporation, which would be centralized agency to trade in power. The proposed corporation could purchase power from large projects and trade in it at the interstate level.

In view of the paucity of resources and the need to bride the gap between the rapidly growing demand and supply. The government has undertaken a policy to

encourage greater investment by private enterprises in this sector. Incentives include:

- → Generation and distribution of power projects of any type and size are allowed.
- → Foreign equity participation can be as high as 100 percent
- → Return on equity of up to 16 percent is assured at 68.5 percent PLF for thermal power plants (with possibility of earning higher return for higher PLF). Similar incentives are provided for hydro electric power projects.
- → A renewable license period of 30yrs has been set
- → Import duty at the confessional rate of 20 percent has been set for import of equipments.
- → The government allows a 5 year tax holiday for power generating projects with an additional 5 years in which a deduction of 30 percent of taxable profit is allowed.

RAILWAYS:

Indian railway is the second largest system in the world under a single management, with an extension network of 62,725 km, 21.5 percent of which is electrified. Indian railway operates an extensive network. It ranks 2nd in the world (After China) in terms of freight intensity, track to land ratio, wagons, to track, ratios, passengers and cargo. Freight traffic carried in IFY 1997 – 98 was 430 million tons, up 5.5 percent over the previous years. The target of IFY 1998 – 99 was 450 million tons and an annual growth rate of 7.4 percent had been

projected for the next five years. Indian Railway has launched a program to reduce terminal delays and turn around time of its ruling stock. The program aims at increasing freight caring capacity by 50 percent through continual usage of wagons. Indian railway is also soliciting private sector participation in freight movement through a Build-Own-Operator-Transfer (BOOT) scheme and a Own-Your-Wagon-Scheme (OYWS).

Thrust areas identified for improvements and expansion includes:

→ Replacement and renewal of over-aged assets.

→ Augmentation of terminal and rolling stock capacities.

→ Gauge conversion and electrification.

→ Introduction of new routes and long distance special parcel services.

ROADS:

India's road networking covers 2.9 million km, the third largest in the world, with only 34,298 km of national Highways suitable for speedy transportation. Though it constitutes less than 2 percent of the total road network, it carries more than 40 percent of the traffic. According to government estimates, by the year 2000 road traffic will account for 87 percent and 65 percent of passenger and goods traffic, respectively, compared with 80 percent and 60 percent at present. About 20 percent of the NH need widening from single to double lanes, and about 70 percent of two lane roads have to be strengthened. Selected corridors on NH need conversion into Expressway.

The government is looking for both private investment and foreign to build national highways and their maintenance. The NHAI (National Highway Authority of India) received a budgetary allocation of $ 56 million in the Indian financial year 1997 – 98. Private parties investing funds in identified projects will be permitted to recover their investment by way of collection of tolls for specified periods. At the end of the agreed period, the facilities will revert to the government provisions relating to foreign investment in the road sector have also been considerably liberalized and include:

- → Automatic approval for foreign equity participation up to 74 percent in the construction of roads and bridges.
- → Automatic approval for foreign equity participation up to 51 percent in land transport support services such as operation of highway bridges, toll roads and vehicles.
- → Land required for construction and operation of facilities will be made available by the government free from encumbrances.
- → Five year tax holiday with subsequent deductions of 30 percent for the next five year.

Duty free imports of road building machinery are now permitted in order to attract more private investment. Banks and FIs have cleared a draft model concession agreement for road projects, which incorporates project, specific traffic guarantees. It also envisages safeguards for both investors and the NHAI. The government has decided to offer sovereign guarantees on all new multilateral

loans in the road sector which are routed through NHAI, which will aid in NHAI in securing additional funding.

SHIPPING:

Overseas shipping has an extremely important role to play in India's international trade. The country has the largest merchant shipping fleet among developing countries and ranks 15th in the world in shipping tonnage. The fleet strength at the end of December, 1996 was 484 vessels of 7.05 Gross Registered Tonnage.

A new shipping policy was initiated in 1990 –91 to promote the development of Indian Shipping. Since then several policy reforms have been made in conformity with the liberalization of the economy, including: automatic approval for the acquisition of ships, permission to retain sale proceeds for reinvestment, relaxation of Cabot age Laws for container ships and lash barges, and decontrol of freight and passenger fares to promote coastal shipping.

Several incentives for investors introduced are easing of controls on the acquisition and sale of vessels, foreign investment is permitted, and facilities at part with 100 percent export oriented units (Eons) are available for the ship repair industry.

TELECOMMUNICATION:

India operates one of the largest telecom networks in Asia, comprising over 21,328 telephone exchanges with a capacity of over 15 million lines and 12 million working connections. The network has been growing at annual rate of

21.6 percent and is expected to expand to over 24 million lines by the turn of the century. However, there is scope for much improvement as even today three of every four villages have no telephone service,. and only 5 percent of India's villages have long distance service.

The entire telecom equipment manufacturing industry has been de-licensed and de-reserved, with the deregulation of the economy in July 1991. The National Telecom Policy of 1994 opened up the area of basic telephone services to private sector participation. The tremendous response of global telecom giants, in joint ventures with Indian companies, resulted in perhaps the most competitive bidding for telecom services witnessed anywhere in the world. In August 1995, the Lok Sabha passed a bill amending the Indian Telegraph Act 1885, paving the way for setting up a Telecom Regulatory Authority of India (TRAI). The TRAI has well defined functions, responsibilities and power to function as the Watchdog of the telecom sector. The terms of reference inter alia include standard setting, price regulation, ensuring technical compatibility among different service providers, facilitating revenue sharing arrangement between the DOT and private operators and fixation of access charges.

Specific government reforms include:

→ Value added Services (VAS), including cellular mobile telephones, radio paging, electronic mail, voice mail / audited services, videotext services, data services, video-conference and credit card authorization services, was opened for private sector participation in 1992.

→ Maximum foreign equity of 49 percent has been permitted in the case of a basic services cellular mobile, radio paging, VSAT and other wireless services.

→ 51 percent foreign equity is allowable in other value added services, including e-mail, voice mail, on-line information, database retrieval and data processing, enhanced / value added facsimile services.

STATEMENT OF THE PROBLEM:-

There is a crisis of infrastructure in our country. There is a need to search "economics of infrastructure in India". We adopted an economic path in which without infrastructure rapid and higher economic development is next to impossible. Economics of infrastructure should be treated as a separate and modern branch of economics. The economics of infrastructure deals with a school of thoughts namely economic and social infrastructure. Infrastructure deals with economic, social, and human development. As Indian circumstances, problems and prospects are quite different compared to other countries of the world, we need to study economics of infrastructure in Indian context. There are problems of finance, profitability, administrative hurdles, mismanagement, misdirected planning and implementation etc. there is a need to find out best alternative solution.

SCOPE OF THE STUDY:-

To produce efficiently, to export competitively and to use resources effectively, it is essential to improve the infrastructure. Many countries of the world have already introduced a major infrastructure sector reform programs in the form of privatization, competition and deregulation.

Infrastructure is still the responsibility of government sector. The shortage of the infrastructure and lower rate of investment and underproduction of goods and services relating to infrastructure has become the main cause of concern for the economic planners, thinkers and as well as economic administrators. There is need to change in whole strategy, direction and nature of economic development. We should put more stress on social, human and natural infrastructure development. We should think over infrastructure less or less-infrastructure oriented development strategy through decent realized industrial development by tiny, cottage, rural and agro based industries.

OBJECTIVES:-

In the light of survey of literature, the following are formulated as the objectives of the present study:

(1) The principle objective of the study is to investigate the nature of infrastructure facilities available in the states of India in an intemporal framework.

(2) To produce efficiently, to export competitively and to use resources effectively, find the methods / measures for the improvement of infrastructure.

(3) To find out infrastructural development and economic growth of major states in India.

(4) To study the investment patterns of infrastructure sector during pre and post reform period and to analyze the impact of new economic policy on the contribution of this sector in the growth and development process of GDP of the country.

(5) To analyze the impact of effective infrastructure sector on the development of India's economy.

(6) To analyze the causes of poor performance of this sector in the country and to study about the new opportunities and initiatives.

(7) To enlist the major policy reforms taken in infrastructure sector after the initiation of economic liberalization.

METHODOLOGY USED IN THE STUDY:-

In order to achieve above mentioned objectives, a simple and basic statistical tools like Mean, Standard Deviation, (S. D.), Coefficient of variation (C.V.) and Correlation Coefficient (r) are carried out primarily with the help of secondary data available from the different issues of economic survey, central budget and state finances.

The performance of various states of India is being presented with the help of compound growth rates of NSDP, PCNSDP, expenditure on energy, and expenditure on transport & communication, in different periods.

The performance of Gross Domestic Product and Gross Domestic Investment of the different sectors of India can be understood with the help of compound growth rates of GDP and GDI in different periods.

PERIOD OF THE STUDY:-

To analyze the expenditure patterns of different states of India, a period of 1996-97 to 2007-08, is considered Due to the non availability of data of few the years; only the period of ten years is taken in the study. To analyze the investment pattern of infrastructure sector, a period of 25 years, i.e. 1980-81 to1990-91 as pre reforms period and 1990-91 to 2005-06 as post reforms period, is considered.

SOURCES OF DATA:-

The present study mainly relies on secondary data obtained from the publication of the Directorate of Planning and statistics, government of different states, the Annual Report of the lead Banks of different states and various reports of CMIE (Center for Monitoring Indian Economy) published time to time. The information presented in CMIE is sourced from official publication issued by various ministries, which covers the entire network.

For collecting the investment records the main consistent source is National Accounts Statistics (NAS) brought out by the Central Statistical Organization (CSO).

LIMITATIONS:-

The data available for the study are subject to few limitations which are as follows -

- Lack of the uniformity of the measuring units of the data available.
- Lack of the relevant data regarding outcomes of the sector as percentage of GDP.
- Lack of the data on constant prices.
- Non availability of data, especially of few states, for e. g. Assam, Bihar, Karnataka, Meghalaya, regarding expenditure on energy sector.

PLAN OF THE STUDY:-

The whole study has been divided into six chapters-

Chapter I provides a general introduction about the study.

Chapter II reviews the related literature.

Chapter III analyses the investment behavior on infrastructure sector in pre and post reforms period.

Chapter IV attempts to study the infrastructure development of Major States of India.

Chapter V is devoted to the study of infrastructure financing & insurance and the major players in this field in India

Chapter VI Summary of findings with the concluding remarks is presented.

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Chapter II

Review

Of

Literature

- INTRODUCTION
- CONCLUSION
- REFERENCES

INTRODUCTION

Many studies have attempted to link aggregate infrastructure spending to growth of gross domestic product (GDP) by using time series analysis and show a high return on infrastructure investment. Some studies also use cross sectional data to link economic growth and infrastructure variables and positively and significantly correlated with growth in developing countries.

Starting with MOHRING AND HARWITZ (1962) study which shows that public investment must be increased. They says that the financial viability of a public infrastructure facility under optimal pricing and investment depends upon its costs are jointly characterized by constant returns to scale, then the facility's revenue form marginal cost pricing will fully cover its capital and operating costs. If costs are characterized by decreasing returns to scale, marginal cost pricing will provide excess revenue, conversely if costs are characterized by increasing returns to scale, then marginal cost pricing will not cover costs.

P. C. SARKER (1989) explained that regional imbalances are to a large extent built in due to unequal natural endowments and lack, of infrastructure facilities which form the basis for rapid economic growth. The deficiencies and inadequacies in the development polices of the government might have also aggravated the already existing economic disparities over the years.

An attempt has been made by him in an article entitled – "Measurement of Imbalances in Regional Development in India" Graphical Approach", to study the regional imbalances prevailing in the major states of Indian Union on the basis of more comprehensive set of indicators such as percentage of urban population

and percentage of population below poverty line apart from indicators pertaining to agriculture, industry etc. this is done in a more rigorous manner through there graphical procedures involving the use of advanced statistical techniques for presenting multivariate data. The three graphical approaches are – (i) Dendrogram, (ii) Two - dimensional representation of first two factors of principal components and (iii) Biplot based on cluster analysis, principal components analysis and singular Value Decomposition Method, respectively.

Despite the several measures taken by the government and the policy thrust towards development of backward regions of the county on apriority basis, still there are considerable disparities prevailing in the different states of the country and seen within different parts of devaloped states. It is, therefore, necessary to monitor the efforts for reduction in imbalances over the period so that resources can be diverted to still backward states and backward pockets in developed states.

This study has clearly brought out the various implications of development of states through a well structure broad based analysis of selected criteria for development. Through the three types different to some extent in their ranking of states, the overall classifications of states. The analysis has also brought out the relative strength of states in various indicators which again broadly was in line with similar conclusions emerging from other studies also.

K. T. DUFFY – DENO and R. W. EBERTS (1991). The purpose of their study is to estimate the effect of public infrastructure on regional economic development on measurer by per capita personal income. The paper makes two contributions.

First, they use public capital stock estimate instead of simply using the expenditure. Second, they construct a simple model of both the effects of local public infrastructure on personal income and the effect of personal income on the allocation of local public outlays.

Results derived from annual data for 28 metropolitan areas from 1980 through 1984 reveal that public capital stock has positive and statistically significant effects on per capita personal income. The first is through the actual construction of the public capital stock. The second effect comes through public capital stock as an unpaid factor in the production process and consumption good of households.

Recent studies have concluded the nation's public infrastructure is in serious disrepair. Public capital stock is shown to be an important input into the regional production process, which has long run consequences for enhancing a region's productivity, and thus, its competitive advantage. Therefore well maintained public infrastructure should be an important component of any policy package designed to promote regional economic development.

WILLIAM F. FOX AND TIM R. SMITH (1990) jointly presented an analysis in this they discussed the relationship between public infrastructure policy and economic development. The article concluded the infrastructure cannot be expected to stimulate the conies of all communities, but most communities can benefit from exploring new ways to deliver infrastructure services. This article shows the slowdown in sate and local spending on infrastructure. It discusses how the linkage between public infrastructure and economic development

depends on the individual location in question. It also discusses some options available to state and local officials who wish to deliver infrastructure services more efficiently.

There is less agreement about whether infrastructure can be use as a tool to stimulate economic development in individual locations. Understanding the linkage between infrastructure and economic development, might aid local policy makers in developing a better infrastructure policy for their community. Such understanding might help state policy makers determine which location with in their state will benefit most from additional expenditure on infrastructure.

In this study a useful method is suggested to determine whether infrastructure will contribute to economic development or not. It is to consider the economic characteristics of the region in question. Regions can be classified into three categories – intermediate, congested and lagging – according to their current level of development the presence of ingredients for further development.

CLIFFORD WINSTON (1991) in an article describes that efficient infrastructure policy maximizes the difference between social benefits and the costs of use, including the costs that users impose on others, by specifying pricing guidelines to regulate demand and investment guidelines to specify design. He presents a mathematical derivation of there guidelines. In his article he offers a different perspective on paying for and investing in the transportation infrastructure. Suppose public funds are used to widen the road and to repave it. Benefits will immediately flow from this investment in the form of lower travel time and less vehicle damage.

In a study ALICIA H. MUNNELL (1992) points out that everyone agrees that public capital investment can expand the productivity capacity of an area, both by increasing resources and by enhancing the productivity of existing resources.

To obtain more evidence, he looked at the relationship between public capital and measures of economic activity at the state level. Since no data on state level public or private capital stocks were available, the first step was to construct stock estimates; these estimates were then used in three separate exercises.

The first, parallel to the national work, estimated production functions for states and found that public capital had a significant, positive impact on output, although the output elasticity was roughly one half the size of the national estimate.

The second analysis examined the relationship between public and private investment, which is characterized by two opposing forces. On one hand, public capital enhances the productivity of private capita, raising its rate of return and encouraging more investment. On the other hand, from the inventor's perspective, public capital acts as a substitute for private capital and "crowds out" private investment. The estimated equations confirmed both forces but suggested that, on balance, public capital investment stimulates private investments.

The third exercise used a business location model to explore the relationship between public capital and employment growth. Here the average annual change in employment was estimated as a function of variables reflecting input costs (labor, energy, and land), market size, tam burden and public capital stick. The results showed that, after accounting for all the other factors that affect

employment, public capital had a positive statistically significant effect on employment growth.

Taken together, these three analyses indicate that public capital has positive impact on several measures of state level economic activity, output, investment and employment growth. The magnitudes of these effects are considerably smaller than those found at the national level.

DUTTA ROY CHOUDHARY (1993) studied inter state disparity in terms of overall measure of SDP and household consumer expenditure.

DHOLAKIA'S study (1994) also observed a marked tendency towards convergence among Indian states. Using the sectoral classification of data, his study of 20 state economies of India over the period 1961-62 to 1989-90 found that most of the states experiencing growth acceleration are relatively less well off.

An exercise had been undertaken in the paper of P. C. SARKER (1994), in the framework of the five year plans, to devise measures to assess how far misdistribution of resources among the states has been corrected and whether there has been a noticeable reduction in regional imbalances and changes in the placement of the different states according to the degree of development.

One of the major points of the study is that the influence of plan outlay towards the development of states would be quite considerable. The combine component scores considered as the composite index of development was explained in terms of per capita cumulative plan outlay (CPO).

The analysis of the ranking of states on the basis of the combined component scores (CCS) for all the five years showed that Punjab and Haryana were only 'agriculture SSI' based developed states throughout the study period and were able to occupy the first two positions in the development hierarchy. Bihar remained the least developed state and it had the maximum distance from Punjab. Bihar and Uttar Pradesh maintained the least distance between them and therefore more similarity in their pattern of planned development from 1970 – 71 onwards. West Bengal which was in the third position in 1960 –61 dropped to the ninth position in 1986 – 87, actually received half of the per capita CPO that received by Punjab and Haryana. Again Bihar barely received about one third of the per capita CPO allocated to Punjab and Haryana.

In the paper of P. PURKAYASTHA (1995) entitled 'Infrastructure Sector and Withdrawal of the State' the examination is focused on the implications of the Fund-Bank policies on the infrastructure – particularly power and telecom. The withdrawal of the states from infrastructural services has serious consequences for the entire economy and in redressing inequitable development, both in regional and sectoral terms. Earlier, the provision of power, telecom, transport, irrigation etc. had been considered prerequisites for economic growth. Under conditions of large supply deficits, private sector investments in infrastructure do not lead to any competition but only to growth of monopolies and consequently high cost of services. The threat of withdrawal under conditions of shortages causes the states regulatory role to buckle. The high cost of such services means that only a handful of people are able to avail of infrastructure facilities,

widening even more the social disparities. Further, such investments tend to concentrate in areas that are relatively advanced, skewing the existing regional imbalances even further. With high cost of infrastructure access to vital requirements for industrial and agriculture growth are further constrained, leading to increase of existing disparities and lower growth. Construction of 'safety nets' as advocated, are merely palliatives and no solution to such disparities. The high cost of infrastructure makes it difficult for third world economies to be competitive internationally.

Restriction on resource movements plays an important roe in justifying convergence in regional income levels. The existing theories do not highlight its importance. After providing a critique of the BARRO – SALA _ I – MARTIN (1995) approach, the authors present a very preliminary study on the Indian states. It is observed that the states have been 'diverging' rather than converging in terms of their per capita income.

Studies on regional growth imbalances have made significant progress in recent years. CASHIN and SAHAY (1995) and MARJIT and MITRA (1996) have addressed the issue of regional convergence in India with similar data set comprising of Per Capita State Domestic Product over 1961 to 1991. But they came up with the different results.

In an article SUJATA MARJIT and SANDIP MITRA (1996) have tried to present a summary and a critique of the convergence hypothesis quite popular these days in the literature on endogenous growth. They have presented certain figures for the Indian states for the last 30 years and showed that they behaved differently

from the regions with the US, Japan and the OECD nations. They admit a couple of limitations regarding the data set. They try to look at the 30 year period preceding the phase of ongoing liberalization and found some reasons to question the application of the standard theory. In this article they also proposed to do the following. They would like to pursue a full fledged econometric exercise to precisely show the pattern of divergence after correcting the date with state level deflators. Second they shall try to build up a theoretical model that suits the observation after isolating the reasons for the pattern of state level growth rates. They shall analyze whether allocation of development assistance by the central government and anything to do with such pattern. A series of alternative measures of per capita growth rates would be attempted as well as some analysis would be done on convergence or divergence at the sectoral level, i.e., in agriculture, manufacturing etc.

The main objective of the paper, written by RAKESH MOHAN (1997) entitled 'Estimation of Requirements for Infrastructure Investments in India: Implication for Foreign Capital Flows and the Capital Market', is to place the required infrastructure investment within the broad macro economic context trends, such as savings, investments, sectoral outputs, balance of payments including both the current and capital accounts.

A key conclusion from this study is that high growth in trade in absolutely essential if India is to attract external capital inflows of the volumes desired and on a sustainable basis. Infrastructure investments of the level projected therefore imply a sustained growth in exports which is necessary for both the servicing of

increasing level of external liability and for equipment imports in the infrastructure sector. Of the external capital inflows projected our expectation is that about 40% could flow into the infrastructure sectors. Expecting a much higher level of external capital inflows than those projected might will be unrealistic. External savings cannot be expected to finance much more than 10 percent of total domestic investment requirements, or about 12 percent to 15 percent of non physical investments. The bulk of resources for overall investment for infrastructure would have to emanate from domestic savings. The analysis of domestic savings suggest that if an adequate level of resource generation is to take place in the country for the financing of the required investment, public sector savings must rise significantly over the next 5 to 10 years. Increase in public sector savings implies achieving of greater efficiency and financial viability of public sector enterprises such as SEBs. Thus improvement in public sector savings is likely to crowd in private savings flowing into infrastructure sectors. The private corporate sector has exhibited a very encouraging trend in the generation of savings through higher profits and retained earnings over the last few years their share in total savings can be expected to continue to increase as more segments of the economy become corporative. Similarly, household savings shows a continuing increase in financialisation since the early 1980s, along with a corresponding fall in household savings characterized as physical savings.

In an article named 'Regional Imbalance in Infrastructure and Income in India' BUDDHADEB GHOSH AND KUNAL CHATTOPADHYAY (1997) examined the

linkages between per capita income, infrastructural investment and performances, and noticed the following observations – First, per capita public gross investment in infrastructure has remained at very low level. Secondly, the relationship between infrastructure stock per capita and GDP per capita among the Asian countries exhibit the positive linkage thereby implying that richer countries have higher infrastructural stock per capita. Thirdly, this positive relationship between PCNSDP and IDI is confirmed among the Indian states over two different time spans, 1981and 1995. Moreover the position of the Indian states has remained largely unchanged during this period. The eastern states have lagged behind the western and northern states although there is some degree of heterogeneity among the states. Some southern states like Tamil Nadu, Kerala and Kartanaka have also improved their positions considerably.

The paper titled "Infrastructure and Growth – Evidence from major states in India", (1997) presented by KULDEEP KAUR, deals with the comparative study of different states relating to the impact of infrastructure on growth. Physical, social and financial infrastructures have been considered. The hypothesis that better infrastructural facilities bring higher growth rate has been tested economically by fitting linear regression equation. Positive regression coefficients and high value of R^2 indicate that the hypothesis may be accepted.

In the paper "Infrastructure Development of Major States of India" (1997) TUSHAR KANTIDAS studies the pre-requisite of sustained growth of infrastructure as an objective function to be tested. Various indicators for ranking of States by infrastructure have been analyses. Four techniques for the ranking

of the fourteen major states have been used. These are (a) Principal Component Analysis, (b) Factor Analysis, (c) Cluster Analysis and (d) Discriminant Analysis.

N.LALITA, in her paper "Financing of infrastructure in Low Income Economies Like India" (1997), studies the financial problems of infrastructure in respect of low income economies. The investment potentials both from national and international sources have also been examined. It gives a detailed analytical study of financial infrastructure with special reference to the problem of India.

A case study in respect of infrastructural development of West Bengal has been made in the paper titled "Economies of Infrastructure in India, A Case Study of the State of West Bengal" (1997) by BISWAJIT GUHA. The author studies the impact of infrastructure on development and the creation of disparity. A detailed region wise study of physical, social and financial infrastructure in West Bengal has been undertaken and recommendations of balanced growth of infrastructure in various regions have been made.

The paper "Economies Of Infrastructure In India's Economic Growth And Core Infrastructural Development" (1997), written by G.HARIHARAN explains about various energy sectors from the 1950s analytically. The development of transportation is also reviewed.

DILIP HALDER takes up various dimensions of infrastructure including social overhead capital in his paper titled "Infrastructure: concept and provision" (1997) the analysis has been made both in micro and macro formats. The scope of private investment has been analyzed in case of various forms of infrastructure.

Further, the need for foreign direct investment for the improvement of managerial efficiency has been discussed in the light of national interest.

The paper written by BUDDHADEB GHOSH, SUGATA MARJIT AND CHIRANJIB NEOGI (1998) has obtained a relationship between initial PCNSDP and its growth rate over 35 years across Indian states which look very different from the one we usually experienced in the literature on convergence. This gives us something different and therefore should invoke further response from theoretical and empirical researchers.

It is quite possible that the region or states have different 'steady state' levels of per capita real income determined by fundamental long run parameters of saving rate and productivity. If the behavioral parameters are different across states, it may generate 'divergence'.

These results of this paper are very interesting and at the same time suggestive of some further extensions. First, there is strong statistical evidence in favor of 'divergence' across Indian states over the period from 1960 –61 to 1994 – 95. Although the coefficient of determination has been slightly weakened compared to the 30 years period ending in 1990 – 91, the coefficient of variation (meaning regional disparity) has recorded a strong exponential trend over last 35 years. Second, the allocation of plan funds across the states has been made in accordance with the level of income of the states, that is, the poorer states have been receiving proportionately large amount of development funds relative to their richer counterparts all through these years. Given such type of positive discrimination, rising regional disparity may be the outcome of lower efficiency

with which public capital is utilized and also of infrastructural disparity across the states.

GHOSH and DE (1998) has developed a physical infrastructure development indicators (PIDI) for the states taking into account transport (rail and road), irrigation, spread of electricity, per capita consumption of electricity and telephones for different time points from 1971 to 1995 on the basis of principal component Analysis (PCA). According to them, regional imbalance in physical infrastructure has been strongly responsible for rising income disparity across the states.

SATYANANDA SAHOO AND K.K. SAXENA (1999 – 2000) wrote an article entitled 'Infrastructure and Economic Development: Some Empirical Evidence' – realizing the inherent problems associated in the provision of infrastructural services in India, the question arises, is infrastructure responsible for fostering economic growth? To examine the link between infrastructure and economic development few studies have been undertaken both in terms of time series and cross sectional data. Some studies have found one-way relationship from infrastructure to economic growth and some studies found bidirectional relationship. In other words, a high economic growth may lead to more investment in infrastructure services. Dealing with time series data these studies face severe limitation of non-stationary involved with the data which may lead to spurious regression. Furthermore, the relationship established through the production function estimates have not been checked for the existence of long run relationship.

To overcome the aforesaid limitations, an attempt is made in this paper to examine the extent of relationship between various stocks of infrastructure and gross domestic product in India. A Cobb-Douglas production function is estimated where gross domestic product at market prices is assumed to be the output and various sticks of infrastructural services along with total employment as inputs. Infrastructural services like electricity, gas, water supply, railways other transport, communication and storage facilities are included in the model. The study analyzed the impact of various stocks of infrastructure on economic growth in India and also examined the long run or equilibrium relationship through co integration analysis.

Inter state economic and social disparities in India have been increasing in spite of various governmental measures to develop backward areas. The article of N. J. Kurian (2000) assesses disparities in terms of demographic indicators, female literacy, state domestic product and poverty, development and non-development expenditure by state government, shares in plan outlay, investments, banking activities and infrastructure development.

There are considerable disparities in socio-economic development across the Indian states. Efforts through the planning process during the first three decades of the Indian Republic had only partially succeeded in reducing regional disparities. The accelerated economic growth since the early 1980s with increased participation by the private sector appears to have aggravated regional disparities. The ongoing economic reforms since 1991 with stabilization and

deregulation polices as their prime instruments and a very significant role for the private sector seem to have further aggravated the inter-state disparities.

The recent trends in investments both public and private, indicate that if left unaltered by effective public intervention inter state disparities are likely to aggravate. There is a greater need for higher levels of investment in social services and infrastructure in backward states as compared to forward states. The government of backward states is fiscally weak and as such they are unable to find enough resources to meet these investment requirements. Forward states are fiscally better off to improve their comparatively better social and economic infrastructure further. The better off states are able to attract considerable amount of private investment, both domestic and foreign, to further improve their development potential because of the existing favorable investment climate including better socio-economic infrastructure. The backward states are unable to attract private investments because of unfavorable i9nvestemnt climate including poor infrastructure. They are unable to improve the investment climate by improving the existing poor infrastructural facilities due to lack of resources, which is linked to their poor development. Thus, they are in the vicious circle and the solution lies in breaking this circle.

An important factor which influences the speed of socio-economic progress of a state is the quality of governance. It is not a coincidence that the states which are in the forward group are better administered as compared tot the states in the backward group. Forward states are quick in responding to opportunities which enable them to attract more private investment both from domestic and foreign

investments. It is efficiency of administration and availability of infrastructural facilities which are more attractive to them rather than the various tax concession and incentive offered by the state government. Private sector is willing to deal with political and bureaucratic corruption as long as things move faster. In the backward states, corruption and inefficiency coexist and this is a combination private investors avoid.

Recently in the paper of DIPANKAR DASGUPTA, PRADIP MAITI, ROBIN MUKHERJEE, SUBRATA SARKAR, SUBHENDU CHAKRABARTI (2000) offers analytical description of the economic performance of Indian states as reflected in their PCNSDP. Statistical analysis of data for the period 1960 – 61 to 1995 – 96 shows a clear tendency for Indian states to diverge in per capita SDP, but converge in shares of different sectors in the SDP. It was found that establishing the divergence or convergence among the Indian states is itself an interesting and challenging exercise.

A detailed analysis of the effects of education, human capital formation, health care, nutrition etc. may need to be studied carefully. Keeping in mind the positive trends displayed by agriculture and manufacture in the analysis of convergence, it is necessary to analyze sectoral allocations also. The developmental allocation to the states in the successive plans is expected to play an important explanatory role. The present study is limited in scope, especially since the primary focus is on SDP data.

CONCLUSION:-

Our review shows that one of the most important issues in developing economies is regarding the role of infrastructure in promoting and sustaining economic growth. Aggregate economic growth definitely benefits from a health infrastructure.

Most of the studies proved that the impact of infrastructure investment is frequently greater and significant than that of investments in other forms of capital, because infrastructure services are required not only for direct consumption but also for raising productivity.

As we know that in India the influence of social, economic and institutional infrastructure towards the development of states are quite considerable. The nature and rate of growth of infrastructure determines the possibility of development of a country, diversification of production, expansion of trade, control of production growth, alleviation of poverty and protection. The World Development Report 1994, mentioned that the growth of national income of many developing countries was always associated with the growth of infrastructure.

Taking into consideration, the economists, included in our review, we will try to highlight the performance of public sector in meeting infrastructure requirements which is not satisfactory. Private entrepreneur can encourage higher risk in infrastructure sector. To raise the rate of economic growth, private sector, under new economic policy, have been allowed to invest. After that it should be

examined whether infrastructure provided by private sector is adequate or not to faster the rate of growth.

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Chapter III

INFRASTRUCTURE DEVELOPMENT AND ECONOMIC GROWTH OF MAJOR STATES IN INDIA

- INTRODUCTION
- OBJECTIVES
- RESULTS
- CONCLUSION
- REFERENCES
- TABLES & FIGURES

INTRODUCTION:

India is a unique example for its extremely heterogeneous nature in terms of regions, resources, climate, languages and infrastructure. It comprises states and regions of extreme diversity. This diversity is with respect to size, natural resources, endowments, population density, economic organization, infrastructural facilities, industrial and commercial structure and the availability of institutional finance. The goal of regional balance is that all regions should develop equally. According to most of the studies, it was claimed that the economic disparity among Indian states have been increasing rather than decreasing overtime. This means that the richer states have grown at faster rates and poorer states at lower rates, which shows the clear case of divergence. In the words of J. G. Williomson (1965) – "the poor countries are characterized by large and growing regional disparities and the rich countries are generally characterized by small and diminishing gaps". A Buddhadeb Ghosh Prabir De (1998) point out that regional imbalance in physical infrastructure is the major responsible factor for rising income disparity across the states.

Disparities in economic and social development across the regions and interstate disparities have been the major reasons for adopting planning in India since Independence.

Inter state economic and social disparities in India have been increasing in spite of various governmental measures to develop backward areas. This fact was observed and expressed by N. J. Kurian (2000). In his article he assessed disparities in terms of demographic indicators such as female literacy, state

domestic product and poverty, development and non-development expenditure by state government shares in plan outlay, investments, banking activities and infrastructure development.

The objectives of the paper written by Somik V. Lall (1999) are two fold. First, relationship between public policies and regional growth is examined which shows the effects of infrastructure on regional development. Second to examine the role of public investments in the development of Indian states.

The Indian government has made balanced regional development as an integral part of national planning practice and objectives. Chelliah (1996) specifies that 'the national policy of the Indian government has been to ensure balanced development of al the regions and to gradually bring down regional disparities. However it is apparent that despite the initiatives taken under the five year plans, interstate disparities have increased, either due to failure of policy implementation or due to use of inappropriate approaches'.

The government of India has been using the five year plans as a vehicle to address the concern of regional disparities in the country. One of the GOI's objectives was to improve the standard of living of the lowest 30 percent of the population, most of them living in backward areas (Das 1993).

In the world Development Report (1994) it has been highlighted that 'good infrastructure raises productivity and lower the cost of productions age of globalization, the infrastructure sector is the backbone of any economy. Growth of this sector is a pre-requisite for a sustainable growth and development of the economy. Improvement in basic infrastructural facilities like power, irrigation,

transport and telecommunication in the backward states is a pre-condition for the improvement of quality of life of the people and to usher in sustainable economic development in those states.

OBJECTIVES:

Keeping in view the nature of infrastructural facilities required in a country like India and a wide variation among Indian states in regard to culture, availability of natural resources, population density, availability of institutional finance etc. and the availability of published data the objectives of the present chapter are to:

- → Analyze the variation in the Net State Domestic Product (NSDP) across the states and compute the compound Rate of Growth in NSDP.
- → Analyze the pattern of expenditure made by central government on different departments of infrastructure sector like Energy, Transport and Communication.
- → Analyze the pattern of expenditure made by different Indian states on energy, transport and communication from the point of view of different five year plans.
- → Calculate correlation coefficient between Expenditure on Energy, Transport and Communication and Net State Domestic Product of different states, in order to find out infrastructural development and economic growth of some major states.
- → Find out correlation between Central Government Plan Outlay on Energy and Transport and Communication and expenditure made by different states on the same sectors.

→ Analyze the effect of low expenditure on infrastructure on states' NSDP and PCNSDP.

In order to achieve the above mentioned objectives, a simple and basic statistical analysis like Mean, Standard Deviation, (S. D.), Coefficient of variation (C.V.) and Correlation Coefficient (r) is carried out primarily with the help of secondary data available from the different issues of economic survey, central budget and state finances.

Growth rates of various states in regard to NSDP, expenditure made on energy and transport and communication have been calculated by taking time as independent variable and rest of the variables (NSDP, expenditure on Energy and expenditure on transport and communication) as dependent variables. The performance of various states of India can be understand with the help of compound growth rates of NSDP, PCNSDP, expenditure on energy, and expenditure on transport & communication, in different periods .The compound growth rates have been calculated by taking time as independent variable and others as dependent variable.

The equation used for calculating the growth rates is well known compound interest formula as –

$$X = \alpha (1 + r) t \quad \text{----------} (1)$$

Where X, stands for different components like expenditure on Energy sector, and expenditure on Transportation & Communication sectors, and 'r' is the compound rate of growth of X.

Taking the natural logarithm of equation (1), we have

$$Ln\ X = ln\alpha + t\ ln\ (1 + r) \text{ ---------- (2)}$$

Putting $\beta 1 = ln\alpha$ and $\beta_2 = \ln (1 + r)$ equation (2)

$$Ln\ X = \beta 1 + \beta_2 \text{ ---------- (3)}$$

Percentage compound growth rate is calculated by taking antilog of regression coefficient, subtracting 1 from it and multiplying the difference by 100.

RESULTS:

In order to fulfill the objectives of the present chapter, we have analyzed the data of 22 Indian states for which comparable data is available. The variation across the states is enormous in regard to various indicators.

As a result of our first objective, it can be observed form Table – 3.2 that over the period of 1990 - 1991 to 2004 – 05* the average NSDP varies from the top five states Maharashtra with Rs. 138873.90 crore, U.P. with Rs. 92216.50 crore, West Bengal with Rs. 75875.90 crore, Tamil Nadu with Rs. 73061.00 crore and Andra Pradesh with Rs. 69713.3 crore, to the poorest five states Sikkim with Rs. 532.80 crore, Arunanchal Pradesh with Rs. 966.50 crore, Manipur with Rs. 1544.80 crore, Meghalaya with Rs. 2050.00 crore and Tripura

* Time period of NSDP and PCNSDP is up to the year 2004-05 because the data after this year is not available on constant prices.

with Rs. 2600.11 crore. It can also be observed from Table – 3.2 (a) that during the same period the compound Rate of Growth of NSDP was highest among Tripura (11.65 percent), West Bengal (8.94 percent), Karnataka (8.63 percent), Meghalaya (8.42 percent) and Sikkim (8.39 percent). The states which were observed with the lowest compound growth rate are Bihar (1.53 percent, Madhya Pradesh (2.86 percent), U.P. (3.71 percent), Assam (4.09 percent) and Punjab (5.36 percent).

If we see Table – 3.3 which shows PCNSDP during the same period, we find that the top five states are Punjab with average PCNSDP 14709.6 Rs., Maharashtra with 14628.6Rs, Haryana with 13755.3Rs, Gujrat with 13522.09Rs. and Tamil Nadu with 11848.3Rs. The states which are having lowest average PCNSDP are Bihar (3559.50Rs.) Orissa (5658.30Rs.), Uttar Pradesh (5679.40Rs.), Assam (6011.80Rs.), and Manipur (6863.90Rs.). Table – 3.3(a) shows the compound growth rate of PCNSDP of the same duration in which we get that top five states are Tripura (9.8 percent), West Bengal (6.93 percent), Karnataka (6.72 percent, Kerala (5.93 percent) and Andra Pradesh (5.91 percent). Five states on the lowest ranking in this category are Uttar Pradesh (1.18 percent), Madhya Pradesh (1.87 percent), Assam (1.90 percent), Bihar (1.93 percent) and Jammu & Kashmir (2.2 percent).

In order to simplify the above description we are presenting our results in the form of a table. (Table 3.1). The table is containing only those states which are having top five ranking or lowest five ranking in the average NSDP, PCNSDP

and percentage CRG of NSDP and PCNSDP. Figure 3.1 also shows the same thing.

Table : 3.1 COMPARISION OF THE STATES' NSDP AND PCNSDP AT A GLANCE

Net State Domestic Product				Per Capita Net State Domestic Product			
Highest Rank		Lowest Rank		Highest Rank		Lowest Rank	
AVERAGE NSDP	% CRG NSDP	AVERAGE NSDP	% CRG NSDP	AVERAGE PCNSDP	% CRG PCNSDP	AVERAGE PCNSDP	% CRG PCNSDP
Maharashtra	Tripura	Sikkim	Bihar	Punjab	Tripura	Bihar	Uttar Prad.
Uttar Prao.	W.Bengal	Arunachal Pradesh	Madhya Pra.	Maharashtra	W.Bengal	Orissa	Madhya Pra.
West Bengal	Karnataka	Manipur	Uttar Prad.	Haryana	Karnataka	Uttar Prad.	Assam
Tamil Nadu	Meghalaya	Meghalaya	Assam	Gujrat	Kerala	Assam	Bihar
Andhra Pradesh	Sikkim	Tripura	Punjab	Tamil Nadu	Andhra Prad.	Manipur	Jammu & Kashmir

If we observe the above data we find that Maharashtra is a state which has a good ranking in NSDP as well as PCNSDP but its CGR is not good. In case of U.P. we can see that it has good ranking in NSDP but its PCNSDP is not good. It is also in the lowest ranking in the CRG of NSDP as well CRG of PCNSDP. These facts about U. P. makes it very clear that it's NSDP is high but along with that its population growth is also very high which makes its condition critical in the ranking of PCNSPDP and percentage CRG secures a good position in

NSDP, PCNSDP and percentage CRG. As well Tamil Nadu's NSDP and PCNSDP is high but its percentage CRG is not quite considerable. Andhra Pradesh is also good in NSDP and percentage CRG in PCNSDP.

NSDP of Tripura, Meghalaya and Sikkim is not good but their percentage CRG of NSDP and PCNSDP is good, Bihar is such a state where PCNSD along with percentage CRG of NSDP as well as PCNSDP is quite low. In case of Assam its NSDP, PCNSDP and percentage CRG all are very low. Karnataka does not lie in the top 5 ranking of NSDP and PCNSDP but its percentage CRG of both is very high. Manipur lies in the lowest ranking of both NSDP as well as PCNSDP. Madhya Pradesh and Punjab are lying in the lowest ranking of percentage CRG. PCNSDP of Haryana is good but it does not have any ranking in percentage CRG.

The description done by Fig. 3.1 and the above mentioned table fulfill our first objective of the chapter and make it clear that the states which are relatively smaller and having lower per capita income, registered higher percentage CRG of NSDP and PCNSDP. The reason of their high percentage CRG is the better infrastructural facilities which attract more private and foreign investment that act as catalyst in generating income at the higher rate. The reason for lower percentage CRG is poor infrastructural facilities.

In order to fulfill our second objective of the chapter, Table 3.4 and Figure 3.2 are being presented. Both table and the figure show that every year government had planned maximum proportion of the central plan outlay for the

Energy sector. After that the expenditure is done on Transport and then on Communication.

Now our third objective which is related to the state wise expenditure on Energy, Transport and Communication in different plans, we are presenting Table 3.5, 3.6 and Figures 3.3, 3.4 and 3.5. The analysis of the states' expenditure can be done with the help of Table 3.5 (a) and 3.6 (a). In order to simplify this analysis we are presenting Table 3.7.

Table : 3.7 COMPARISION OF THE STATES' EXPENDITURE AT A GLANCE

Expenditure on Energy				Expenditure on Transport & Communication			
Highest Rank		Lowest Rank		Highest Rank		Lowest Rank	
AVERAGE EXPENDITURE	% CRG OF EXPENDITURE	AVERAGE EXPENDITURE	% CRG OF EXPENDITURE	AVERAGE EXPENDITURE	% CRG OF EXPENDITURE	AVERAGE EXPENDITURE	% CRG OF EXPENDITURE
Uttar Prad.	Assam	Kerala	Andhra Prad.	Uttar Pradesh	Bihar	Sikkim	Arunachal Prad.
Madhya Prad.	Gujrat	Andhra Prad.	Punjab	Maharashtra	Madhya Prad.	Jammu & Kashmir	Manipur
Maharashtra	Rajasthan	Tamil Nadu	Himachal Prad.	Tamil Nadu	Haryana	Manipur	Maharashtra
Gujrat	Uttar Prad.	Sikkim	Orissa	Andhra Prad.	Karnataka	Tripura	Megahlaya
Jammu & Kashmir	Haryana	Karnataka	Bihar	Karnataka	Punjab	Meghalaya	Kerala

If we compare Table 3.1 and Table 3.7 we find that UTTAR PRADESH is good in ranking of NSDP because its expenditure on infrastructure sector like Energy as well as Transport and Communication is good. KARNATAKA is a state

where percentage CRG of NSDP as well as of PCNSDP is good. The reason is nothing but its good percentage CRG of expenditure on infrastructure sector. Some states in our country show the opposite trend. They shoe that though their average expenditure as well as its growth rate is good but still they are on the lowest ranking in NSDP and PCNSDP. These are for example MADHYA PRADESH, BIHAR, HARYANA and ASSAM etc. If we observe Table 3.9 we find that these are those states which are mostly having negative correlation between NSDP and expenditure on Infrastructure services. The reason for this negative correlation may be-

- Poor technology involved with the production of infrastructure services.
- Loss of the service during the time of distribution.
- Theft of the service before it reaches to the public.

In order to make the above description more clear we can take a look of Table 4.8 and 4.9. These tables also fulfill our forth as well as sixth objectives.

As a result of our fifth objective, it is evident from Table 3.5(a) that there is a significant positive correlation between central government plan outlay on Energy and expenditure made by the states securing the lower ranking in NSDP or PCNSDP. It proves that the states which are lagging behind are now paying greater attention on their infrastructure services due to which their percentage CRG of NSDP is also increasing. The same facts are clear in Table – 3.6 (a). The states that exhibit negative correlation suggest that they are not giving priority to the infrastructure sector, and that's why their percentage CRG of NSDP and PCNSDP is low. For example Punjab, Manipur, West Bengal etc.

CONCLUSION:

On the basis of our statistical analysis as well as general observations we can conclude that relatively smaller states are spending more on infrastructure sector. Better infrastructure facilities attracted more private and foreign investment, which is attributed to the higher compound rate of growth in Net state domestic product. This study further revealed that from the ongoing economic reforms since 1991 with stabilization, deregulation and significant role of private investment the poor states like Bihar, Orissa, M. P. and Uttar Pradesh have not been benefited. Because none of the above states is in the list of top rank states who have good indicators like higher average – Net State domestic product or higher compound rate of growth in Net State domestic product. The reasons are either the poor infrastructure development or the defective system of production and distribution of infrastructure services in the said states. This fact becomes clearer with the lower value of CRG in expenditure on Energy, Transport and Communication.

In short our analysis suggests that in order to produce efficiently, to use the available resources effectively and to accelerate and maximize the gains of new economic reforms, it is necessary for all the states of India to improve their infrastructure sector immediately.

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Table :3.2 NSDP at constant prices 1993-94 (Rs. crores)

S.No.	States / Years	90-91	96-97	97-98	98-99	99-00	00-01	01-22	02-03	03-04	04-05	MEAN	STND	C.V.
1	Andra Pradesh	4531	61955	60321	68036	70905	77077	80864	83907	91838	97699	69713.30	25936.03	37.20
2	Arunachal Pradesh	591	860	884	910	948	993	1036	1092	1162	1189	966.50	173.75	17.98
3	Assam	12299	14467	14704	14574	15078	15671	16441	17114	18004	19041	15739.30	1964.64	12.48
4	Bihar	37607	24569	23404	24879	26137	31363	28136	32953	29597	33460	29210.50	4618.44	15.81
5	Gujrat	36207	60653	60647	64921	65163	62575	68293	73658	86138	90783	66903.80	15033.05	22.47
6	Haryana	18215	23759	23965	25243	27064	28885	30444	31990	34868	37983	28241.60	5844.40	20.69
7	Himachal Pradesh	3892	5199	5571	5966	6622	6737	7003	7435	8167	8765	6535.7	1442.85	22.08
8	Jammu Kashmir	4915	6321	6652	7005	7270	7399	7765	8117	8536	8983	7296.30	1174.17	16.09
9	Karnataka	29845	44737	47517	53961	56543	62132	63071	65765	68904	76298	56877.30	13503.64	23.74
10	Kerala	19774	28026	28633	30604	32785	33963	34404	37549	40328	44055	33012.10	6863.99	20.79
11	Madhya Pradesh	41833	39057	41101	43815	48415	43099	47098	44065	51900	53539	45392.20	4731.62	10.42
12	Maharashtra	79869	1E+05	1E+05	1E+05	143863	136713	143314	156376	168776	182389	138873.90	28293.60	20.37
13	Manipur	982	1258	1374	1396	1581	1559	1730	1766	1823	1979	1544.80	298.32	19.31
14	Meghalaya	1240	1561	1662	1842	1999	2162	2317	2428	2589	2740	2054.00	481.30	23.43
15	Orissa	13450	16524	18902	19482	20217	20272	21454	21531	25192	27562	20458.6	3987.14	19.49
16	Punjab	23693	30890	31726	33552	35327	36636	37288	38224	40730	43122	35118.80	5523.96	15.73
17	Rajasthan	29713	39682	44509	46457	46574	45664	50238	46177	59690	59911	46861.50	8816.40	18.81
18	Sikkim	295	429	461	494	508	538	575	631	677	720	532.80	125.56	23.57
19	Tamil Nadu	43937	62316	67822	70505	74685	80453	77920	80114	82720	90138	73061.00	12966.61	17.75
20	Tripura	1368	1923	2132	2333	2532	2999	3091	3343	3680	na	2600.11	740.76	28.49
21	Uttar Pradesh	74791	85597	84686	85310	91201	91690	94293	100101	104728	109768	92216.50	10457.60	11.34
22	West Bengal	40633	59496	64484	68598	73528	78254	83849	90077	96478	103362	75875.90	18706.65	24.65

Source: *State Finances: A Study of Budgets (RBI Publications), various issues.*

Table :3.2(a) CRG in NSDP 1993-94 (Rs. crores)

S.N.	States	Dependent Variable	Intercept	Reg. Coeff.	R-Square	CRG(%)
1	Andra Pradesh (a)	ln(a)	10.788	0.0725	0.9231	7.52
2	Arunachal Pradesh (b)	ln(b)	6.5273	0.0599	0.8187	6.17
3	Assam ©	ln(c)	9.436	0.0401	0.9291	4.09
4	Bihar (d)	ln(d)	10.187	0.0152	0.0873	1.53
5	Gujrat (e)	ln(e)	10.691	0.0716	0.7518	7.42
6	Haryana (f)	ln(f)	9.8494	0.0689	0.9476	7.13
7	Himachal Pradesh (g)	ln(g)	8.3474	0.0752	0.9197	7.81
8	Jammu Kashmir (h)	ln(h)	8.5873	0.0536	0.8841	5.51
9	Karnataka (i)	ln(i)	10.463	0.0828	0.8536	8.63
10	Kerala (j)	ln(j)	9.9999	0.0697	0.8838	7.22
11	Madhya Pradesh (k)	ln(k)	10.563	0.0282	0.6966	2.86
12	Maharashtra (l)	ln(l)	11.45	0.0673	0.8058	6.96
13	Manipur (m)	ln(m)	6.9646	0.0654	0.9086	6.76
14	Meghalaya (n)	ln(n)	7.1561	0.0808	0.9594	8.42
15	Orissa (o)	ln(o)	9.5633	0.0627	0.8915	6.47
16	Punjab (p)	ln(p)	10.167	0.0522	0.8675	5.36
17	Rajasthan (q)	ln(q)	10.419	0.058	0.7713	5.97
18	Sikkim ®	ln(r)	5.8066	0.0806	0.8941	8.39
19	Tamil Nadu (s)	ln(s)	10.86	0.0585	0.7642	6.02
20	Tripura (t)	ln(t)	7.272	0.1102	0.9403	11.65
21	Uttar Pradesh (u)	ln(u)	11.226	0.0364	0.94	3.71
22	West Bengal (v)	ln(v)	10.735	0.0856	0.901	8.94

Table : 3.3 PCNSDP at constant prices 1993-94 (Rs.)

S.No.	States / Years	1990-91	96-97	97-98	98-99	99-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	MEAN	STND	C.V.
1	Andra Pradesh	6873	8514	8191	9144	9445	10195	10609	10876	11756	12352	9795.50	1688.95	17.24
2	Arunachal Pradesh	6927	8590	8634	8712	8890	9153	9231	9742	10234	10348	9056.10	982.42	10.85
3	Assam	5574	5793	5796	5664	5785	5943	6122	6254	6466	6721	6011.80	371.68	6.18
4	Bihar	4474	3338	3100	3210	3282	3831	3340	3851	3396	3773	3559.50	418.31	11.75
5	Gujrat	8788	13206	13016	13735	13298	12489	13321	14194	16302	16878	13522.90	2196.22	16.24
6	Haryana	11125	12591	12389	12728	13308	13848	14228	14712	15752	16872	13755.30	1707.64	12.41
7	Himachal Pradesh	7618	9140	9625	10131	11051	11085	11326	11818	12765	13471	10803.00	1737.22	16.08
8	Jammu Kashmir	6272	6978	7128	7296	7384	7385	7552	7675	7878	8075	7362.30	506.01	6.87
9	Karnataka	6631	8990	9416	10549	10912	11854	11857	12212	12634	13820	10887.50	2089.04	19.19
10	Kerala	6851	9145	9265	9819	10430	10714	10762	11605	12328	13321	10424.00	1817.28	17.43
11	Madhya Pradesh	6350	7089	7301	7621	8248	7195	7708	7062	8149	8238	7496.10	614.55	8.20
12	Maharashtra	10159	13464	13925	14199	15257	14233	14656	15764	16765	17864	14628.60	2078.64	14.21
13	Manipur	5393	6022	6434	6401	7097	6851	7445	7446	7532	8015	6863.60	800.96	11.67
14	Meghalaya	6928	7602	7981	8507	8996	9476	9905	10262	10795	11278	9163.00	1434.75	15.66
15	Orissa	4300	4773	5382	5471	5742	5549	5803	5747	6640	7176	5658.30	820.23	14.50
16	Punjab	11776	13705	13812	14333	14809	15071	15308	15407	16119	16756	14709.60	1403.24	9.54
17	Rajasthan	6760	7862	8601	8754	8555	8175	8763	7903	10010	9853	8523.60	951.53	11.16
18	Sikkim	7375	9146	9539	9914	9874	10119	10415	11367	12026	12637	10241.20	1505.08	14.70
19	Tamil Nadu	7864	10451	11260	11592	12167	12094	12484	12696	12976	13999	11848.30	1721.53	14.53
20	Tripura	5026	6239	6828	7396	7968	9397	9664	10261	11136	na	8212.78	2029.31	24.71
21	Uttar Pradesh	5342	5706	5518	5432	5675	5575	5603	5830	5975	6138	5679.40	244.71	4.31
22	West Bengal	5991	7880	8408	8814	9320	9796	10380	10987	11608	12277	9546.10	1880.91	19.70

Source: ***Source:*** *State Finances: A Study of Budgets (RBI Publications), various issues.*

Table : 3.3(a) CRG in PCNSDP 1993-94 (Rs.)

S.N.	States	Dependent Variable	Intercept	Reg. Coeff.	R-Square	CRG(%)
1	Andra Pradesh (a)	ln(a)	8.8599	0.0574	0.9468	5.91
2	Arunachal Pradesh (b)	ln(b)	8.9163	0.0344	0.8312	3.50
3	Assam ©	ln(c)	8.5967	0.0188	0.8739	1.90
4	Bihar (d)	ln(d)	8.0309	0.0191	0.4196	1.93
5	Gujrat (e)	ln(e)	9.2448	0.0462	0.6305	4.73
6	Haryana (f)	ln(f)	9.304	0.0397	0.954	4.05
7	Himachal Pradesh (g)	ln(g)	8.9809	0.0535	0.9309	5.50
8	Jammu Kashmir (h)	ln(h)	8.782	0.0218	0.868	2.20
9	Karnataka (i)	ln(i)	8.9189	0.065	0.8548	6.72
10	Kerala (j)	ln(j)	8.9203	0.0576	0.8824	5.93
11	Madhya Pradesh (k)	ln(k)	8.8174	0.0185	0.4504	1.87
12	Maharashtra (l)	ln(l)	9.3388	0.044	0.7651	4.50
13	Manipur (m)	ln(m)	8.6182	0.0381	0.9128	3.88
14	Meghalaya (n)	ln(n)	8.8226	0.0525	0.9685	5.39
15	Orissa (o)	ln(o)	8.385	0.0448	0.8685	4.58
16	Punjab (p)	ln(p)	9.4229	0.0307	0.8792	3.12
17	Rajasthan (q)	ln(q)	8.891	0.028	0.5575	2.84
18	Sikkim ®	ln(r)	8.9636	0.0473	0.8879	4.84
19	Tamil Nadu (s)	ln(s)	9.1158	0.046	0.7328	4.71
20	Tripura (t)	ln(t)	8.517	0.0935	0.9674	9.80
21	Uttar Pradesh (u)	ln(u)	8.5797	0.0117	0.6832	1.18
22	West Bengal (v)	ln(v)	8.7766	0.067	0.9194	6.93

Fig. : 3.1 Percentage CRG in NSDP & PCNSDP

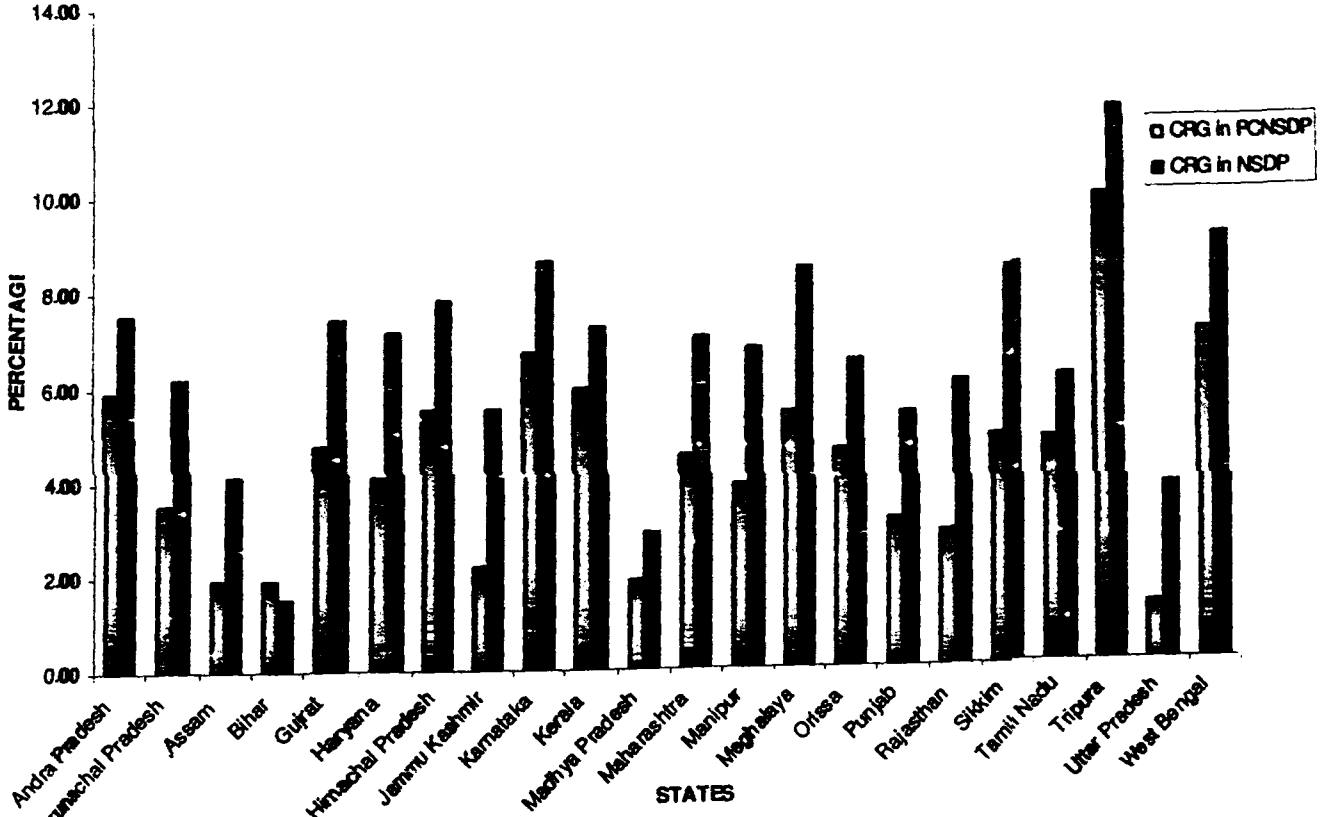

Table : 3.4 CENTRAL PLAN OUTLAY (RS. CRORE)

S.NO.	Departments/Years	1996-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06	06-07	07-08	Mean	Stnd	C.V.
1	Energy	19601.4	21128.8	23978.9	26182.5	26095.5	29787	36825.5	42248.4	43656.9	53720.1	69825.3	72293.2	38678.79	18041.49	46.64
	Power	6596.3	7422.7	8822.2	9366.8	10064.8	12540.7	12970.8	15141.7	17280.2	22532.9	29225.9	34353.7	15526.56	8883.27	57.21
	Petroleum	10528.3	10914.7	11936	12318.3	12418.9	13757.8	20540.9	2388.7	22999.2	27538.5	34782.1	33173.8	17775.02	10007.23	56.30
	Coal & Lignite	1932.1	2328.8	2624.8	3683.1	2753.4	2632.7	2425.6	2378.6	2518.4	3109.2	3799.4	3644	2819.18	604.18	21.43
	Non conventional Energy	544.8	462.6	594	814.4	858.5	855.8	888.2	827.4	759.1	539.5	1017.9	1058.8	768.42	192.75	25.08
2	Transport	14383.7	12985.4	14397.5	17155.5	20847.7	30077	27811.5	25869.5	28332.3	40412	49818.8	66830.1	29093.42	16697.65	57.39
	Railway	8300	8403	8755	8965	11249	8578	12051	13485	15274.1	18265.4	24636.1	29893.4	14012.92	7069.27	50.45
	Ports & Lighthouses	768	879.3	1002.2	1542.9	1347.7	6975.5	712.5	538.5	485.8	776.4	754.3	1050.9	1401.17	1782.58	127.22
	Shipping	1933.4	306.9	1120.9	645	740.5	904.2	815.4	831.6	762.2	1194.8	1752.3	1270.7	1023.33	462.76	45.22
	Civil Aviation	2237.5	1594.2	1601.8	1680	1885.4	1485.7	2038.5	1485.7	1468	2343	2304.7	11218.7	2628.60	2724.35	103.64
	Roads & Bridges	1092.9	1734.8	1648.3	4263.7	5548.2	12040.3	12124.9	9540.2	8253.3	17590.8	19852.6	24851.8	9878.48	7729.27	78.24
	Inland Water Trans.	23.4	34.4	41.2	37.8	55.5	73.3	46.2	64.2	83.5	61.3	75.9	82.6	56.61	20.06	35.43
	Other Services	15	21.6	20.9	20.5	21.5	20	23	24.4	25.3	180.4	142.9	562	89.79	158.47	176.48
3	Communication	10074.8	11137.4	13466.8	14990.4	20317.3	18906.5	14214.3	12889	9131.8	17525.1	17851.4	18598.6	14746.68	3580.39	24.28
	Postal Services	85	80	84.1	96	120	99.1	95	75	180.5	381.7	398.1	234.6	160.76	116.95	72.75
	Telecommunication	9387	10050	12184.8	13885	18165.3	17723	13276	12633	8856	16992	17252	16107	13876.09	3357.95	24.20
	Other Communication Services	602.6	1007.4	1197.9	919.4	2032	1084.4	841.3	152	95.3	151.4	201.3	256.9	711.83	584.05	82.05
4	2+3	24458.3	24122.8	27864.3	32065.9	41165	48983.5	42025.8	38628.5	35464.1	57937.1	67676.2	85528.7	43842.10	18574.72	42.37

Source: *Expenditure Budget Vol. I, Ministry of Finance, Government of India, various issues.*

Fig. 3.2 : Central Plan Outlay by Heads of Departments

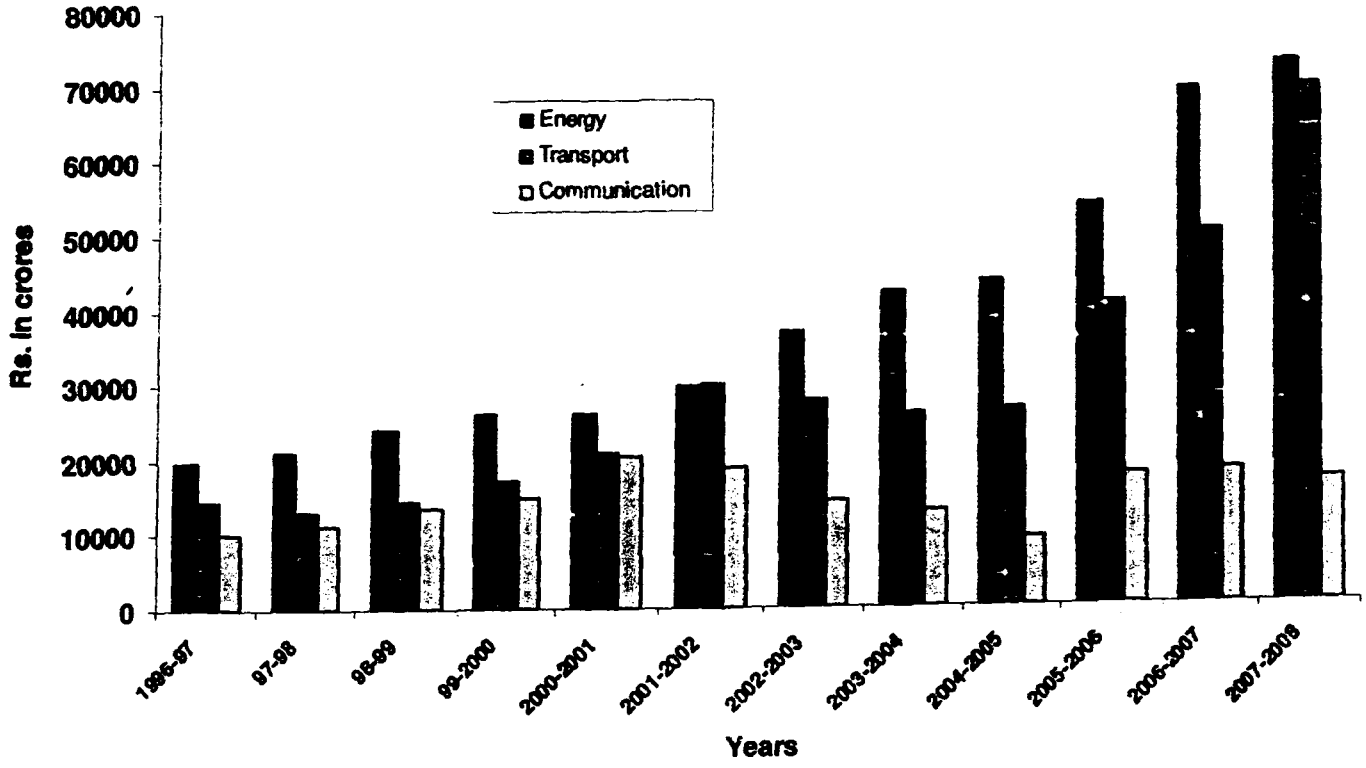

Table : 3.5 EXPENDITURE ON ENERGY BY DIFFERENT STATES (RS. CRORES)

S.No.	States / Years	96-97	97-98	98-99	99-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	Mean	STND	C.V.
1	Andra Pradesh	-907.5	31.6	17.7	176.9	45.3	22.1	24.2	839.6	29.9	0.01	28.0	416.0	1486.62
2	Arunachal Pradesh	75.5	87.4	69.1	95.9	86.9	91.7	112.6	170.4	105.6	124.1	101.9	29.2	28.63
3	Assam	na	na	na	3	na	39	64.1	81.9	1374.2	205.4	294.6	533.3	181.04
4	Bihar	na	na	na	96	na	na	na	na	1.7	302	133.2	153.6	115.27
5	Gujrat	-11.9	-27.2	-64.3	5.9	29.9	-48.4	-86.1	8.4	2623.1	1950	437.9	987.8	225.55
6	Haryana	na	0.8	325.2	349.9	264.8	38.3	134.2	162.6	233.4	275.5	198.3	122.8	61.94
7	Himachal Pradesh	68.7	176	135.4	2.8	na	164.2	358.6	94	2.1	na	125.2	115.3	92.04
8	Jammu Kashmir	331.4	207.5	142.8	331.6	241.5	253.1	407.6	594.8	629.6	1037.1	414.7	270.5	65.24
9	Karnataka	na	na	na	na	na	na	na	na	na	50	50.0	na	na
10	Kerala	2.3	0.3	0.2	na	na	na	3.5	na	na	na	1.6	1.6	102.03
11	Madhya Pradesh	151.1	834.5	99.8	154.8	238.7	172.8	347.5	328.2	2747.1	3236.2	831.1	1163.4	139.99
12	Maharashtra	408.6	343.6	291	197.7	2194.8	282.9	291.1	297.2	482.6	562.2	535.2	592.9	110.79
13	Manipur	42.1	50.2	49.8	185.7	50.8	21.5	16.4	30.2	39.3	28.7	51.5	48.7	94.65
14	Meghalaya	na	na	na	na	na	na	na	na	na	na	na	na	na
15	Orissa	197.6	na	63.9	11.2	0.3	50.2	na	20.6	36.4	na	54.3	66.9	123.22
16	Punjab	na	na	na	na	na	125.9	181	360.7	72.4	45.3	157.1	125.2	79.70
17	Rajasthan	115.2	747.4	0.3	2.1	30	333	333.5	282.8	350	630.6	282.5	257.6	91.17
18	Sikkim	30.7	31	33.8	26.5	32.4	49.7	53.8	43.8	99.6	88	48.9	25.4	51.90
19	Tamil Nadu	133.8	574.3	-57.6	-726.1	-219.4	100	25	200	85	25	14.0	330.5	2360.52
20	Tripura	39.2	27.3	26.6	37.4	75.5	63.8	60.6	41.3	143.5	129.4	64.5	41.3	64.01
21	Uttar Pradesh	na	na	120	100	780	741.4	332	6234.8	1046.2	760.1	1264.3	2037.1	161.13
22	West Bengal	821	na	na	10	42.2	1	141.8	141.8	331.8	636.7	265.8	308.6	116.09

Source: *State Finances : A Study of Budgets (RBI Publications), various issues.*

Table : 3.5(a) CRG IN EXPENDITURE ON ENERGY DURING 1996-97 to 2005-06

S.No.	States	Dependent Variable	r*	Intercept	Reg. Coeff.	R-Square	CRG(%)
1	Andra Pradesh (a)	ln(a)	0.4361	5.831	-0.4695	0.1705	-37.47
2	Arunachal Pradesh (b)	ln(b)	0.7342	4.2304	0.0657	0.5855	6.79
3	Assam ©	ln(c)	0.3562	-1.7356	0.8242	0.7823	128.01
4	Bihar (d)	ln(d)	0.5523	4.6049	-0.1308	0.0239	-12.26
5	Gujrat (e)	ln(e)	0.7172	-1.8986	0.7588	0.5471	113.57
6	Haryana (f)	ln(f)	0.1499	2.618	0.336	0.2243	39.93
7	Himachal Pradesh (g)	ln(g)	0.0101	4.7686	-0.1636	0.0601	-15.09
8	Jammu Kashmir (h)	ln(h)	0.9229	4.991	0.1583	0.6515	17.15
9	Kamataka (i)	ln(i)	-	-	-	-	0.00
10	Kerala (j)	ln(j)	0.6664	-0.923	0.228	0.1748	25.61
11	Madhya Pradesh (k)	ln(k)	0.7634	4.5004	0.2665	0.4365	30.54
12	Maharashtra (l)	ln(l)	-0.0882	5.8541	0.0271	0.0152	2.75
13	Manipur (m)	ln(m)	-0.3218	4.2285	-0.0958	0.1948	-9.14
14	Meghalaya (n)	ln(n)	-	-	-	-	0.00
15	Orissa (o)	ln(o)	-0.4946	3.8541	-0.1608	0.047	-14.85
16	Punjab (p)	ln(p)	-0.2566	7.172	-0.2961	0.339	-25.63
17	Rajasthan (q)	ln(q)	0.4168	2.3255	0.3748	0.185	45.47
18	Sikkim ®	ln(r)	0.8443	3.0718	0.1303	0.7466	13.92
19	Tamil Nadu (s)	ln(s)	0.045	2.7939	0.0744	0.0089	7.72
20	Tripura (t)	ln(t)	0.7607	3.1398	0.1566	0.6431	16.95
21	Uttar Pradesh (u)	ln(u)	0.3504	4.0201	0.3582	0.4458	43.08
22	West Bengal (v)	ln(v)	0.1413	3.5809	0.1256	0.0258	13.38

* r is the correlation coefficient between central govt. plan outlay on energy & expenditure made by different states on energy.

Fig. 3.3 : State wise Average Expenditure on Energy from 1996-97 to 2005-06

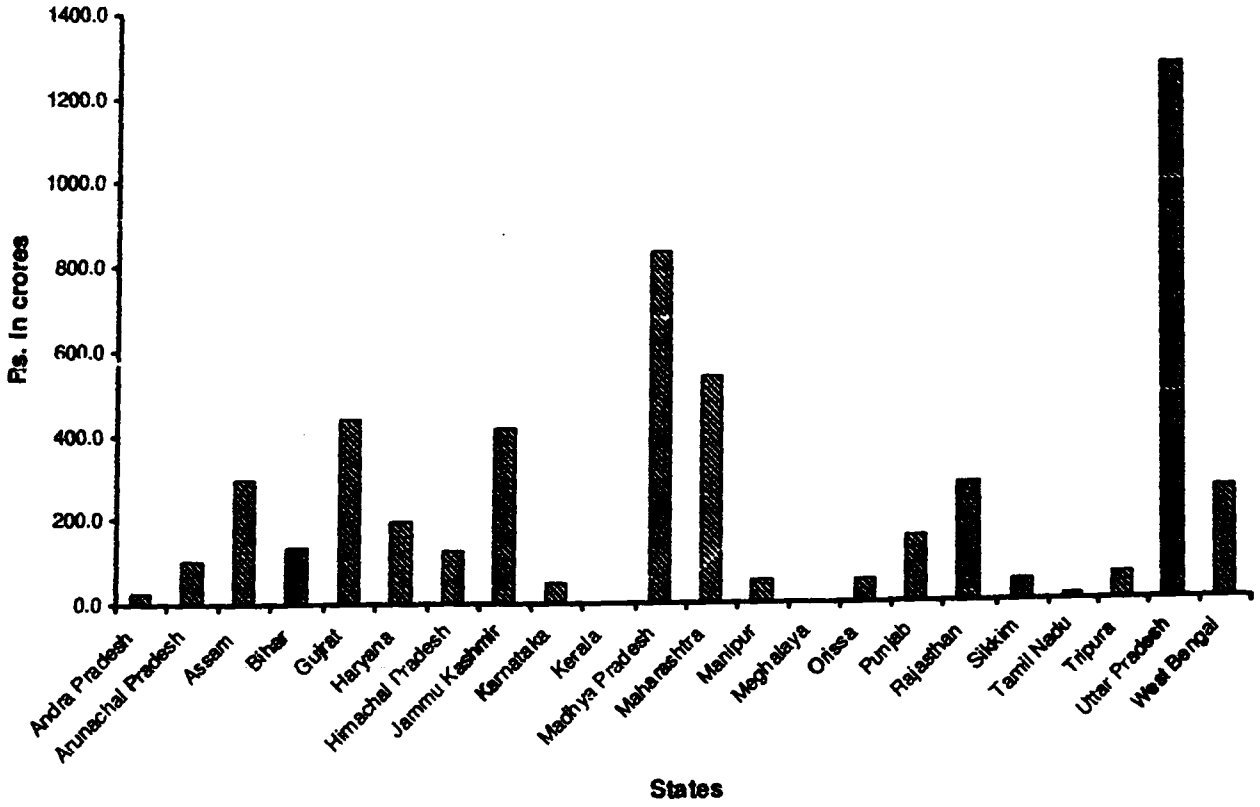

Table : 3.6 EXPENDITURE ON TRANSPORT &COMMUNICATION BY DIFFERENT STATES (RS. CRORES)

S.No.	States / Years	1996-97	97-98	98-99	99-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	Mean	STND	C.V.
1	Andra Pradesh	196.10	101.30	261.20	346.40	779.60	759.30	886.40	554.00	547.20	839.10	527.06	286.64	54.38
2	Arunachal Pradesh	114.90	123.30	93.50	92.80	94.00	98.90	74.50	106.90	na	95.50	99.37	14.19	14.28
3	Assam	83.60	92.20	137.00	182.80	22.20	187.40	186.10	185.60	299.30	433.80	161.00	116.68	64.46
4	Bihar	80.10	0.40	155.40	235.30	115.70	66.40	126.60	123.00	na	275.00	130.88	83.93	64.12
5	Gujrat	106.10	154.70	247.80	331.90	398.70	247.00	427.50	510.20	na	723.60	349.72	191.26	54.69
6	Haryana	43.80	48.30	52.50	36.00	71.00	259.90	216.00	310.20	292.30	360.50	169.05	130.55	77.23
7	Himachal Pradesh	99.30	137.40	189.90	250.30	193.10	145.00	174.30	256.70	200.20	273.80	192.00	56.22	29.28
8	Jammu Kashmir	6.00	6.50	103.40	98.90	134.00	9.50	15.20	10.50	32.80	50.50	46.73	47.99	102.70
9	Karnataka	111.60	129.90	164.70	175.10	290.20	264.70	423.10	510.20	895.90	1030.50	399.58	324.63	81.24
10	Kerala	141.80	228.80	184.50	222.90	182.10	229.60	301.00	260.60	252.00	311.00	231.43	52.91	22.86
11	Madhya Pradesh	73.60	64.40	71.70	77.30	116.00	237.30	314.90	407.40	546.70	809.20	271.85	251.72	92.59
12	Maharashtra	545.90	624.00	873.50	916.60	704.50	800.30	522.10	1033.20	751.90	1084.80	785.68	193.40	24.62
13	Manipur	76.70	66.10	48.10	47.00	22.90	20.60	30.40	34.70	87.40	76.10	51.00	24.20	47.46
14	Meghalaya	58.30	63.00	66.90	80.20	92.10	50.20	87.40	89.00	90.20	86.00	76.33	15.30	20.05
15	Orissa	164.80	150.40	131.60	131.80	144.20	120.70	308.80	201.00	360.90	318.90	203.31	90.79	44.66
16	Punjab	55.50	38.50	63.80	61.30	79.50	180.70	153.30	111.00	132.90	374.50	125.10	99.22	79.31
17	Rajasthan	173.80	223.50	208.60	115.70	185.50	149.90	291.40	353.10	264.50	299.90	226.59	74.54	32.90
18	Sikkim	23.50	30.70	19.00	17.20	40.30	55.70	39.60	40.40	71.70	71.50	40.96	19.87	48.52
19	Tamil Nadu	385.50	393.70	440.60	460.10	378.10	408.80	374.60	1230.90	842.40	1635.40	655.01	443.31	67.68
20	Tripura	37.30	51.00	37.80	51.80	50.90	95.00	66.30	106.30	101.60	149.30	74.73	36.79	49.23
21	Uttar Pradesh	378.00	331.30	715.70	516.60	592.80	218.20	849.60	903.90	1192.20	3187.00	888.53	859.79	96.76
22	West Bengal	108.40	171.70	204.00	365.90	616.00	533.60	243.00	248.00	235.70	318.90	304.52	160.35	52.66

Source: *State Finances: A Study of Budgets (RBI Publications), various issues.*

Table : 3.6(a) CRG IN EXPENDITURE ON TRANSPORT & COMMUNICATION DURING 1996-97 to 2005-06

S.No.	States	Dependent Variable	r*	Intercept	Reg. Coeff.	R-Square	CRG(%)
1	Andra Pradesh (a)	ln(a)	0.898	5.0262	0.1906	0.628	21.00
2	Arunachal Pradesh (b)	ln(b)	-0.488	4.7075	-0.0231	0.2179	-2.28
3	Assam ©	ln(c)	0.6421	4.0714	0.1622	0.3618	17.61
4	Bihar (d)	ln(d)	0.4824	2.6247	0.3167	0.2187	37.26
5	Gujrat (e)	ln(e)	0.8002	4.7517	0.1877	0.8463	20.65
6	Haryana (f)	ln(f)	0.7717	3.1993	0.2856	0.8313	33.06
7	Himachal Pradesh (g)	ln(g)	0.5039	4.8184	0.0721	0.477	7.48
8	Jammu Kashmir (h)	ln(h)	0.0098	2.893	0.0655	0.027	6.77
9	Karnataka (i)	ln(i)	0.6633	4.3208	0.2529	0.9658	28.78
10	Kerala (j)	ln(j)	0.6653	5.0657	0.0643	0.653	6.64
11	Madhya Pradesh (k)	ln(k)	0.7392	3.5348	0.304	0.9346	35.53
12	Maharashtra (l)	ln(l)	0.4721	6.413	0.041	0.242	4.19
13	Manipur (m)	ln(m)	-0.2603	3.8562	-0.007	0.0017	-0.70
14	Meghalaya (n)	ln(n)	0.3193	4.0788	0.043	0.3624	4.39
15	Orissa (o)	ln(o)	0.4105	4.6812	0.1004	0.5389	10.56
16	Punjab (p)	ln(p)	0.894	3.5337	0.1951	0.7624	21.54
17	Rajasthan (q)	ln(q)	0.3238	4.9955	0.0684	0.3583	7.08
18	Sikkim ®	ln(r)	0.7352	2.849	0.1367	0.6615	14.65
19	Tamil Nadu (s)	ln(s)	0.5876	5.5632	0.139	0.5878	14.91
20	Tripura (t)	ln(t)	0.8082	3.4155	0.1445	0.8456	15.55
21	Uttar Pradesh (u)	ln(u)	0.6574	5.5093	0.1807	0.5302	19.81
22	West Bengal (v)	ln(v)	0.5631	5.2144	0.0699	0.1668	7.24

* r is the correlation coefficient between central govt. plan outlay on transport & communication & expenditure made by different states on transport & communication

Fig. 3.4 : State wise Average Expenditure on Transport & Communication From 1996-97 to 2005-06

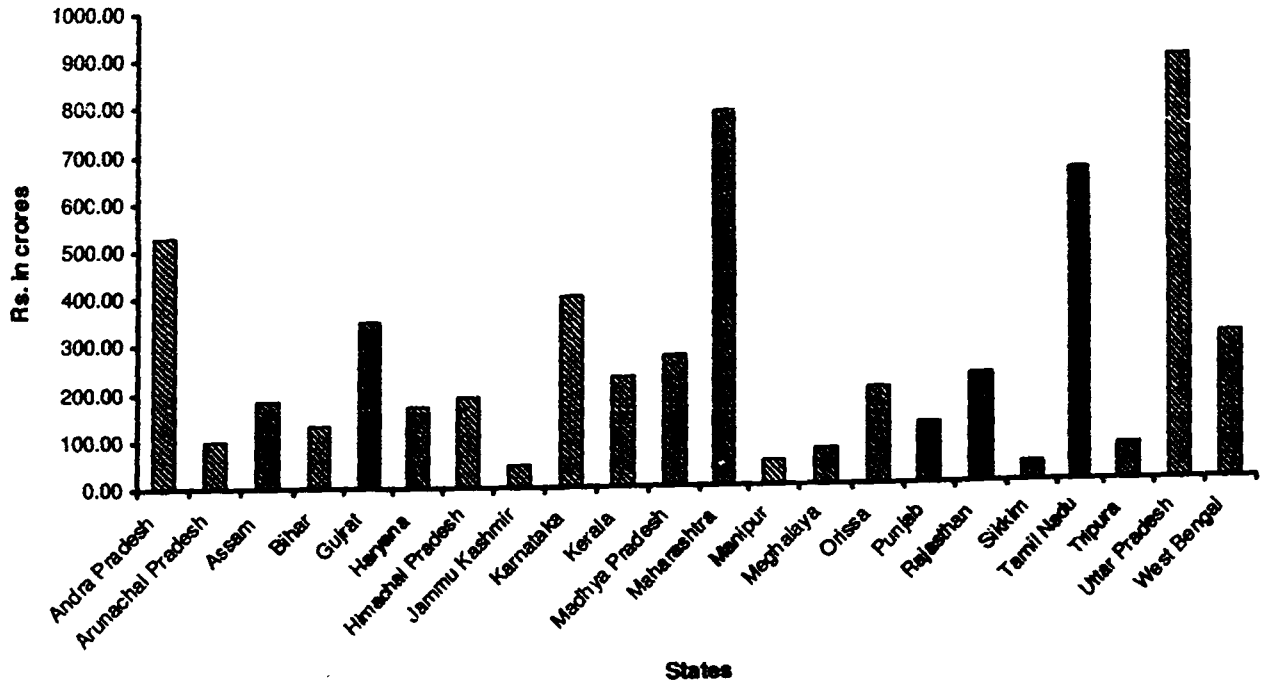

Fig. 3.5 : State wise Average Expenditure on Energy, Transport & Communication from 1996-97 to 2005-06

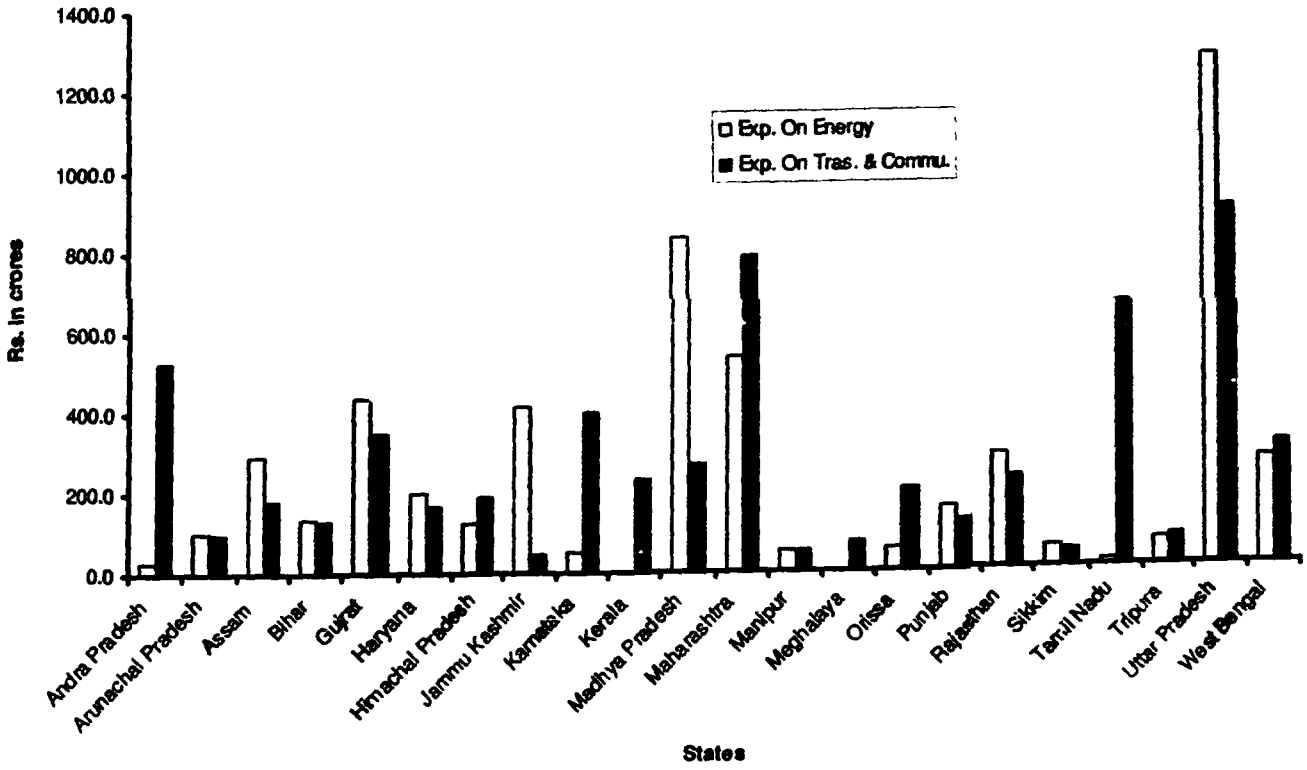

Table: 3.8 Relationship between Expenditure on different components of Infrastructure Sector and Net State Domestic product of Different States in India.

S.NO.	STATES	COEFFICIENT OF CORRELATION BETWEEN NSDP & EXPENDITURE ON ENERGY	COEFFICIENT OF CORRELATION BETWEEN NSDP & EXPENDITURE ON TRANSPORT & COMMUNICATION
1	Andra Pradesh	0.553955	0.68133
2	Arunachal Pradesh	0.746012	-0.454172
3	Assam	0.740407	0.745299
4	Bihar	-1	0.214557
5	Gujrat	0.689302	0.764246
6	Haryana	-0.004422	0.90427
7	Himachal Pradesh	-0.086294	0.61027
8	Jammu Kashmir	0.80277	-0.151863
9	Karnataka	-	0.900169
10	Kerula	0.664917	0.6846
11	Madhya Pradesh	0.534967	0.796959
12	Maharashtra	0.011185	0.323969
13	Manipur	-0.18562	-0.163526
14	Meghalaya	-	0.616429
15	Orissa	-0.567015	0.681452
16	Punjab	-0.058648	0.698443
17	Rajasthan	0.174292	0.59943
18	Sikkim	0.806084	0.776522
19	Tamil Nadu	-0.144689	0.560551
20	Tripura	0.574969	0.825027
21	Uttar Pradesh	0.507977	0.780917
22	West Bengal	-0.417489	0.198119

Table: 3.9 Ranking of States according to the Degree of Correlation

r BETWEEN NSDP & EXPENDITURE ON ENERGY			r BETWEEN NSDP & EXPENDITURE ON TRANSPORT & COMMUNICATION		
HIGHEST RANK	LOWEST RANK	NEGATIVE CORRELATION	HIGHEST RANK	LOWEST RANK	NEGATIVE CORRELATION
1. Sikkim 2. Jammu & Kashmir 3. Arunachal Pradesh 4. Assam 5. Gujrat	1. Maharashtra 2. Rajasthan 3. Uttar Pradesh 4. Madhya Pradesh 5. Andra Pradesh	1. Bihar 2. Haryana 3. Himachal Pradesh 4. Manipur 5. Orissa 6. Punjab 7. Tamil Nadu 8. West Bengal	1. Karnataka 2. Tripura 3. Uttar pradesh 4. Madhya Pradesh 5. Gujrat	1. West Bengal 2. Bihar 3. Maharashtra 4. Tamil Nadu 5. Rajasthan	1. Arunachal Pradesh 2. Jammu & Kashmir 3. Manipur

Here 'r' is the coefficient of correlation

Chapter IV

INFRASTRUCTURE INVESTMENTS

IN

PRE AND POST

ECONOMIC REFORMS

- INTRODUCTION
- IMPLEMENTING REFORMS
- FINANCING MECHANISM
- PRIVATE PARTICIPATION : A SOLUTION
- INFRASTRUCTURE INVESTMENT PRE & POST ECONOMICS REFORMS
- OBJECTIVES
- RESULTS
- DIAGNOSING THE CAUSES OF POOR PERFORMANCE
- EFFICIENCY OF INVESTMENT
- CONCLUSION
- REFRENCES
- TABLES AND FIGURES

Introduction:-

India spends around 4.6 percent of its Gross Domestic Product (GDP) on infrastructure; only about half of what China spends. There is little doubt that the investment need is substantially higher than there is provision for in the government's budgetary allocation.

In spite of an overwhelming demand for investment in infrastructure, its provision has largely remained within the purview of the public sector because of such inherent characteristic as non excludability, externality, huge capital investment, long gestation period etc. This is mainly due to two reasons –

- The government had the idea that private operators might exploit the natural monopoly of infrastructure / utility services.
- Moreover, it did not interest the private operators very much because of the huge risks involved in infrastructure projects and the low return during the initial years of investment.

Several research studies and various committees appointed by the government have estimated the investment requirement for financing the ever increasing demand for infrastructure services. In December 2006, the union government set up a seven member committee headed by Deepak Parekh to address the challenges of financing projects. The committee recommended changes in existing regulation and policies to facilitate availability of non dept capital. Some other key recommendation included development of the domestic debt capital market, tapping the insurance sector, providing fiscal incentives, enhancing participation of bank, institution and non banking finance companies, and

utilization of FOREX reserve, setting up equity flows and facilitating greater foreign investments.

Government recognizes the critical importance of the infrastructure sector and accord the higher priority to development of various infrastructure services such as power, telecommunication, seaports, airports, railways, roads etc. Investment in these sectors involve high risk, low return, lumpiness of huge investment, high incremental capital output ratio, long payback periods and superior technology.

The study made by Alicia H. Munnell reveals that public capital can spend the productive capacity of an area, both by increasing resources and by enhancing the productivity of existing resources. The work of Aschaur (1989)[1] ,Alicia H. Munnell (1992) [2] and Holz-Eakin (1988) [3] suggest that the impact of aggregate public capital on private sector output and productivity is very large. They have proved that a 1 percent increase in the stock of public capital would increase output by 30 percent. Where the marginal productivity of public capital estimated is about 30 percent.

IMPLEMENTING REFORMS:-

Economics reforms are for economic development. For implementing economic reforms successfully, development of infrastructure is essential; therefore government has taken various steps in the various budgets. The paper entitled' Development of Infrastructure Sector' presented in the IEA 1st Amrit Jubilee (80th) Conference (1997) [4] by Minaxi Patel, emphasizes on the importance of

economics reforms for economics development, for which the prerequisite is development of infrastructure sector.

Economic policies began to change in the 1980s and a much bolder program of economic reforms was introduce in 1991, which has been continued by successive governments since then. These reforms are aimed at closing the gap between India's potential and our actual performances.

FINANCING MECHANISM:-

Since the reform process began in 1991, and with the removal of the various restrictions in industries during the License Raj, it was realize that the infrastructure sector also has to be open to private operators to meet the increasing investment needs. Moreover, the government also realizes that alternative financing mechanisms had to be developed to meet these needs.

The alternative sought was in the form of funds available from the domestic capital market, foreign funds and private participation. The use of domestic markets funds was restricted due to the under develop domestic capital market, which does not provide funds for the long run required for infrastructure projects.

The recent phenomenon of globalizing financial flows, which has integrated the financial markets all over the world, has often been seen as a solution towards financing long term capital investment in infrastructure projects. Such initiatives in India have, however remained limited due to the very composition of foreign capital inflow and the nature of the sectors that largely attract these funds.

PRIVATE PARTICIPATION: A SOLUTION

In recent times, private investment – domestic and foreign, is invited to develop infrastructure in Third Word Countries allowing market force to operate in its own way. Starting from early Middle Age, a stage which was yet to transcend household economy, trading activities involving movement of goods from one place to another could hardly be separated fro the transport services. In the first instance there was no separation of the business of carrying goods from that of selling them. A single merchant or a group forming a syndicate would invest in trading venture – i.e. a ship and cargo – which was wound up when the voyage was completed and cargo sold. This system survived until recent times.

The state has found necessary to place obligations on transport promoters and operators and to circumscribe their freedom in the public interest. The nature of this public interest has been differently conceived a different stage of development of transport and accordingly legislative restrictions has changed in character from time to time. The legislative restriction were imposed first of all to promote safety to user and providers of transport facilities and then to limit and control monopoly facing transport operators to accept some obligations of public services.

To ensure safety, to check monopoly, to control competition and to effectuate coordination between modes and various other related activities, governmental interventions with legisiative measure was considered indispensable. These considerations are the main reasons for governmental interventions and control

even today. The purpose is to concentrate government's resource to build infrastructure in a planned way as the matter of developmental strategy to attract private investment.

Thus the government has left with the sole option of seeking private investment for financing capital investment in the infrastructure sector. However, the hitherto existing structure of infrastructure provision in India never interested the private sector. As a result, the government came up with large scale sector reform to facilitate private participation in various infrastructure sector – power, telecom, roads, oil and natural gas, shipping and urban infrastructure.

INFRASTRUCTURE INVESTMENT PRE AND POST ECONOMICS REFORMS

Acceleration in economic growth at the projected rate will clearly not be possible to achieve without a corresponding acceleration in the rate of investment in infrastructure because these two are positively correlated with each other and the degree of this correlation is also very high. Beside acceleration in the rate of investment, it is also very important to check whether this investment is efficient and productive or not. This chapter is written basically to find out the effectiveness of economic reforms on different types of investments for e.g. gross domestic investment (GDI), infrastructure investment, infrastructure investment by public sector and infrastructure investment by private sector.

The performance of gross domestic product and gross domestic investment of the different sectors of India can be understood with the help of compound growth rates of GDP and GDI in different periods .The compound growth rates have been calculated by taking time as independent variable and GDP and GDI as dependent variable.

The equation used for calculating the compound growth rates is same as mentioned in chapter III.

The percentage compound growth rate is calculated by taking antilog of regression coefficient, subtracting 1 from it and multiplying the difference by 100.

OBJECTIVES:

The objectives of the present chapter are --

1. To show whether GDI is the correct measure, which can increase GDP by showing the degree of correlation between GDP and GDI.
2. To find out the percentage CRG of different infrastructure investments i.e. public, private and gross, with reference to pre and post reform period.
3. To prove that low percentage CRG of GDI is the reason of low percentage CRG of GDP.
4. To find out the solution of the problem to improve low percentage CRG.

RESULTS: -

Table 4.1 and 4.2 show the raw data about Gross domestic Product (GDP), Gross Domestic Investment (GDI) and infrastructure investment from the period 1980-81 to 2005-06. The data is further divided into two parts in order to see the effects of new generation economics reforms on investment by public sector as well as by private sector on infrastructure, so that we can judge the effectiveness of investment on GDP_{mp}. It is clear from Fig-4.1 that, there is very high degree of positive correlation between Investment and country's GDP. Higher the investment higher will be the GDP and vice versa.

Tables 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11 and 4.12 show the to improve low percentage CRG of GDP_{mp} before and after economic reforms, GDI before and after economic reforms, Infrastructure investment before and after economic reforms, infrastructure investment by public sector before and after economic reforms and infrastructure investment by private sector before and after economic reforms respectively. Table 4.13 shows all these percentage CRG at a glance by which we can draw some conclusions more easily and promptly.

The table shows that in post reform period percentage CRG of GDP_{mp} is declined and the reason for this low percentage CRG is nothing but the low percentage CRG of investments. It is also very clear that after adopting the policies of new economics reforms, especially the policy of privatization, percentage CRG of the investment by private sector is increased from 16.01 percent to 18.7 percent. Now after drawing the result that percentage CRG of

gross investment and infrastructure investment has declined during second generation economics reform, it is also essential to find out the causes of this poor performance.

DIAGNOSING THE CAUSES OF POOR PERFORMANCE:-

Both the union and state government have taken a number of initiatives since 1991 to attract private investment into infrastructure. These efforts have yielded some fruit. There has been an increase in private sector capacity in power, telecommunications and ports – but the response has been much less than was hoped for. The principal reason for this is that the pre-conditions for successful entry of private sector are not easy to establish. The problem varies sector to sector but there are few general problems which we wish to highlight:

The first is the problem of 'user charges'. Investment in infrastructure can either be financed on the basis of reasonable user charges or on the basis of state subsidies. Most of our infrastructure sectors suffer from inadequate user charges e.g. very low tariffs for agricultural consumers and domestic consumers of power, no user charges for roads, low user charges for railway passengers etc. Since the ability of the state compensate for low user charges by providing budgetary subsidies is extremely limited, it follows that user charges have to be raised if infrastructure is to be financed. It is important to note that this is true whether we retain infrastructure as an exclusive public sector monopoly, or bring in the private sector into this area rationalization of user charges in infrastructure is absolutely vital.

Even if the user charges issues is resolved, it will still be difficult to bring in private investment if the regulatory regime is not sufficiently transparent to reassure private investors. The establishment of a regulatory regime that is seen to be fair to consumers and also sensitive to the legitimate needs of investors is absolutely essential if we want to attract private investors into infrastructure. Although regulatory authorities have been set up in various infrastructure sectors, they have had teething problems in the early year, and this has been an impediment to attracting investors.

Thus, the establishment of rational user charges and credible regulatory authorities are the two critical features on which the success of infrastructure development will depend.

EFFICIENCY OF INVESTMENT:

It is important to study about how much is invested in different sectors by our public and private sector but more important is that how much this investment is efficient to increase our economic growth. It is generally assumed that higher level of public investments would lead to faster economic growth. But there are examples with relatively high levels of investment but slower than average growth. This fact is clearly illustrated in chapter III as well as in our regression results where we have calculated compound growth rate of GDP, GDI, GDP (public sector), GDI (private sector) and GDI (Infrastructure sector). And the results bring us to the conclusion that at which rate we increase investments of different types, GDP did not increase at the same rate. The rate of increase in

GDP is less than the rate of increase in investments. As we can see in table 4.1 which shows the data's related to the period 1980-90. In this duration our GDI's growth rate is 15.75 percent (Table 4.5) but with the result GDP increase at the rate 14.22 percent (Table 4.3).

What would be the reason? How can we seek out the leakage?

The explanation lays in the productivity of investment, or rather the lack of it. So many reasons may be there ---- for e.g.

- Spreading limited resources thinly across too many projects and schemes is one of the most common factors that lower the productivity of investment.
- Political pressure to begin new schemes in new areas to please new sets of voters has negatively impacted the efficiency and quality of public investment.
- Another major problem of public expenditure management in Indian states relates to operation and maintenance (O&M) what is the use of adding to productive assets when the existing ones are not adequately maintained ?
- Sometimes efficiency of investment declines when adequate social infrastructure (as – education, manpower, housing etc) as well as financial infrastructure (as – Banking facilities) are not providing to requirement.

CONCLUSION:

The task of reforms is far from over. Our growth remains below the levels achieved by other East Asian countries. We need to grow at much faster rates if we are to raise the standards of living of mass of our people, create a sufficient growth of high quality jobs for increasingly better educated new entrants to labor force and bring about a sharp reduction in poverty. The government expenditure, in real terms, on infrastructure sector has declined substantially since 1991. The fiscal constraints of the government has given support to the new thinking of withdrawal of the state ownership and control of infrastructure activities and this role is left to private investors with incentives and other support provided by the government. Since the onset of the economic liberalization strategy in 1991, the government of India has taken initiatives and given numerous financial crutches to attract and facilitate private investment in this area. The procedure relating to foreign investment in the infrastructure sector has been liberalized. But the performance of this sector has not improved in comparison with the period 1985-90 and adverse effects and evident in the performance of Key infrastructure industries.

To advocate economic reform does not mean that no mistakes might be made in implementing them or that there may not be side effects to be taken care of. Nor does it mean that in a federal democracy there may not be legitimate constraints that may have to be accommodated.

In the process of economic reforms it is possible that some sections of our population especially those in rural areas have benefited less. But the fault lies

not in the reforms implemented but in the lack of implementation of reforms in other important areas such as agriculture, infrastructure, education and health care services etc.

From the policy point of view it is important in any case to emphasize that reforms should not focus only on the rich and ignore the rest. The essence of reform is to increase the productivity of all sections of society by making competition free and access to markets easier.

Infrastructure development is accorded high priority by the government of India. The government has taken a number of initiatives for the development of efficient infrastructure and towards creating and enabling environment for private participation and enhancing competition in the infrastructure sector.

A key conclusion emerging from the above analysis is that different types of investments are not sufficient for the economic growth but more important is the allocation and efficiency of this investment, so that we can maintain the growth rate of our gross domestic product according to the efforts.

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Table : 4.1 INVESTMENTS IN INFRASTRUCTURE IN INDIA : BEFORE ECONOMIC REFORMS (1980-81 to 1990-91)

Rs billion at current prices		1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91
A.	GDPmp	1360.1	1597.6	1781.3	2075.9	2313.4	2622.4	2929.5	3332.0	3957.8	4568.2	5355.3
B.	Gross Domestic Investment	308.8	342.1	363.4	418.1	454.7	581.7	611.6	764.6	969.7	1138.2	1448.5
a-	Infrastructure	60.8	80.1	91.9	95.7	112.6	136.5	176.2	184.4	219.4	251.7	287.4
i)	*Electricity, Gas, Water Supply*	31.7	42.1	48.3	50.6	55.5	72.4	96.3	103.8	113.0	123.4	144.1
ii)	*Railways*	8.1	9.8	10.7	11.9	14.0	16.9	23.1	21.5	26.4	26.4	30.8
iii)	*Other transports*	17.5	22.6	26.8	25.9	34.3	37.4	45.3	44.0	57.9	73.6	83.3
iv)	*Storage*	0.2	0.4	0.3	0.6	0.5	0.6	0.8	0.8	0.8	0.9	0.7
v)	*Communications*	3.2	5.2	5.8	6.8	8.3	9.2	10.7	14.3	21.4	27.3	28.6
b-	Other	248.0	262.0	271.5	322.4	342.1	445.2	435.4	580.2	750.3	886.5	1161.1
C.	GDI (Public Sector)	117.7	167.8	201.0	203.8	249.2	308.7	354.2	330.6	393.6	455.7	521.5
a-	Infrastructure	47.7	58.3	70.3	73.2	86.3	104.1	142.3	145.2	167.1	193.5	217.3
i)	*Electricity, Gas, Water Supply*	29.5	37.3	44.4	47.6	52.8	69.1	90.9	98.8	105.6	117.6	137.7
ii)	*Railways*	8.1	9.8	10.7	11.9	14.0	16.9	23.1	21.5	26.4	26.4	30.8
iii)	*Other transports*	6.7	5.8	9.1	6.7	10.7	8.5	17.0	10.1	13.5	21.9	19.7
iv)	*Storage*	0.2	0.2	0.2	0.3	0.4	0.4	0.6	0.5	0.3	0.4	0.5
v)	*Communications*	3.2	5.2	5.8	6.8	8.3	9.2	10.7	14.3	21.4	27.3	28.6
b	Other	70.0	109.0	130.7	130.6	162.9	204.7	211.9	185.4	226.5	262.2	304.2
D.	GDI (Private Sector)	191.1	174.3	162.4	214.3	205.6	272.9	257.4	434.0	576.1	682.5	927.0
a-	Infrastructure	13.1	21.8	21.6	22.5	26.3	32.4	33.9	29.2	52.3	58.2	70.1
i)	*Electricity, Gas, Water Supply*	2.2	4.8	3.8	3.0	2.7	3.3	5.5	5.0	7.3	5.9	6.4
ii)	*Railways*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
iii)	*Other transports*	10.8	16.8	17.7	19.3	23.6	28.9	28.3	33.9	44.5	51.8	63.5
iv)	*Storage*	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.5	0.5	0.2
v)	*Communications*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b	Other	178.1	152.5	140.8	191.8	179.2	240.6	223.5	394.8	523.8	624.3	856.9

Source: *National Accounts Statistics brought out by the Central Statistical Organization.*

Table : 4.2 INVESTMENTS IN INFRASTRUCTURE IN INDIA : AFTER ECONOMIC REFORMS (1991-92 to 2005-06)

Rs billion at current prices		91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04	04-05	05-06
A.	GDPmp	6168.0	7053.3	8010.3	9456.2	10884.1	11637.8	12437.7	13318.9	14275.0	15371.4	16566.9	17898.0	19372.1	21013.4	22825.9
B.	Gross Dom. Invest.	1440.2	1631.8	1733.3	2384.1	2825.5	3091.4	3391.1	3696.4	4075.5	4512.0	4930.9	5415.3	5938.8	6523.4	7179.5
a-	Infrastructure	350.5	387.3	452.2	494.1	598.6	675.0	758.7	852.4	956.4	1076.0	1192.8	1324.5	1472.3	1639.0	1826.8
i)	*Electricity,Gas,Water*	189.0	189.8	213.8	233.0	318.6	348.6	382.4	416.8	459.5	508.8	555.9	610.6	669.6	735.5	809.5
ii)	*Railways*	33.2	49.2	55.8	59.6	72.9	79.8	87.5	95.4	105.2	116.4	127.2	139.8	153.3	168.4	185.3
iii)	*Other transports*	95.8	97.8	124.4	128.9	130.6	162.9	197.0	240.1	281.3	326.6	376.2	427.4	488.6	558.5	636.8
iv)	*Storage*	0.5	0.5	0.6	0.6	1.2	1.3	1.4	1.5	1.7	1.9	2.0	2.2	2.4	2.7	2.9
v)	*Communications*	32.1	50.0	57.5	72.1	75.4	82.5	90.4	98.6	108.7	120.3	131.5	144.4	158.4	174.0	191.5
b	Other	1089.7	1244.5	1281.1	1890.0	2226.9	2416.4	2632.4	2844.0	3119.1	3436.0	3737.2	4090.9	4466.5	4884.3	5353.4
C.	GDI (Public Sector)	565.0	623.6	687.5	832.5	1088.4	1163.8	1243.8	1331.9	1427.5	1537.1	1656.7	1789.8	1937.2	2101.3	2282.6
a-	Infrastructure	266.5	278.4	346.9	387.1	477.4	511.1	546.3	587.2	639.7	693.4	750.4	806.4	872.9	938.0	1019.4
i)	*Electricity,Gas,Water*	174.1	154.5	204.4	222.7	302.7	324.2	348.0	370.2	399.8	432.4	461.4	494.6	529.0	566.4	615.2
ii)	*Railways*	33.2	49.2	55.8	59.6	72.9	74.9	80.0	85.7	91.8	98.9	106.6	115.1	124.6	135.2	146.8
iii)	*Other transports*	26.6	24.3	28.6	32.2	32.6	40.7	49.2	60.0	70.3	82.1	94.0	106.9	122.1	139.6	159.2
iv)	*Storage*	0.5	0.5	0.5	0.5	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.7	1.8
v)	*Communications*	32.1	50.0	57.5	72.1	67.8	70.1	67.8	69.0	76.1	78.2	85.5	86.7	95.0	95.7	95.7
b	Other	298.6	345.1	340.6	445.3	611.0	652.7	697.4	744.7	787.8	843.7	906.2	983.4	1064.3	1163.3	1263.2
D.	GDI (Private Sector)	875.2	1008.3	1045.8	1551.7	1737.1	1927.7	2147.3	2364.5	2648.0	2974.9	3273.4	3625.5	4001.5	4422.0	4896.9
a-	Infrastructure	84.1	108.9	105.3	107.0	121.2	163.9	212.4	165.2	316.7	382.6	442.4	518.0	599.3	701.1	806.7
i)	*Electricity,Gas,Water*	14.8	35.3	9.4	10.3	15.9	24.4	34.4	45.8	59.7	76.3	94.5	116.0	140.6	169.2	194.3
ii)	*Railways*	0.0	0.0	0.0	0.0	0.0	4.9	7.5	9.7	13.4	17.6	20.7	24.6	28.7	33.2	38.5
iii)	*Other transports*	69.2	73.6	95.8	96.7	97.9	122.2	147.7	180.1	211.0	246.4	282.1	320.6	366.4	418.9	477.6
iv)	*Storage*	0.1	0.1	0.1	0.1	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1
v)	*Communications*	0.0	0.0	0.0	0.0	7.5	12.4	22.6	29.6	32.6	42.1	46.0	57.8	63.4	78.3	95.7
b	Other	791.2	899.4	940.5	1444.6	1615.8	1763.0	1935.0	2099.3	2331.3	2592.3	2831.0	3107.5	3402.2	3721.0	4090.2

Source: *National Accounts Statistics brought out by the Central Statistical Organization.*

Fig : 4.1 CORRELATION BETWEEN GDPmp & GDI
(Year 1980-81 to 2005-06)

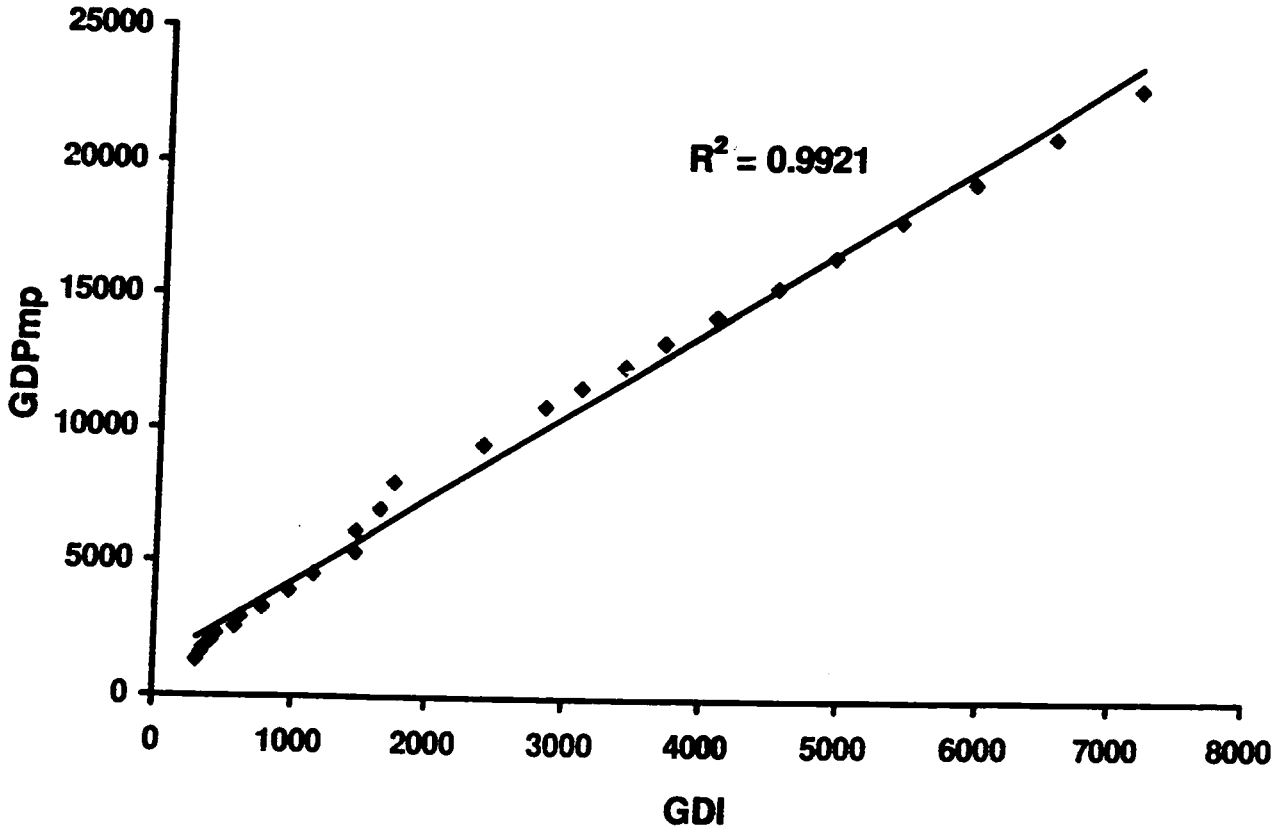
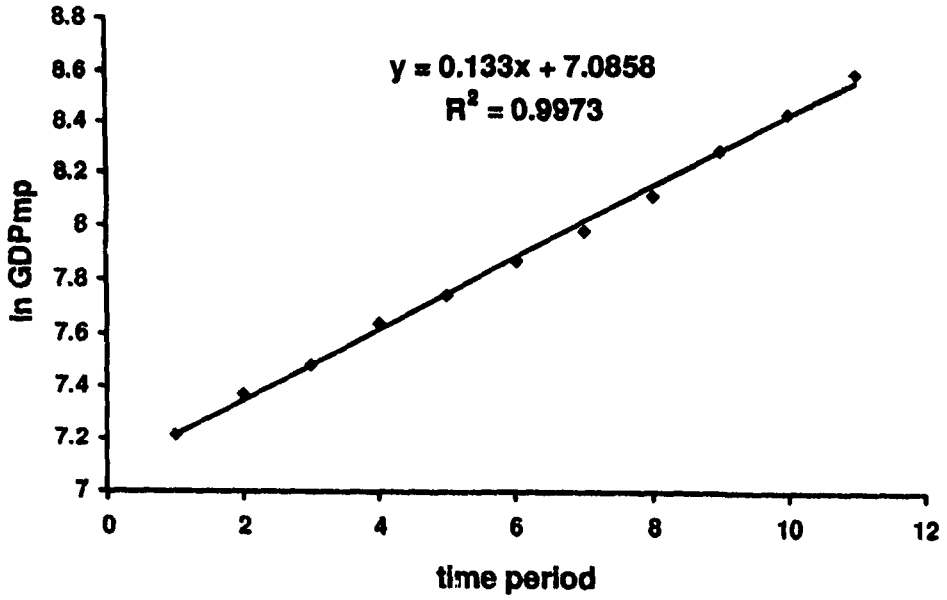


Table : 4.3 Percentage CRG IN GDPmp before economic reforms

year	GDPmp	ln GDPmp
1980-81	1360.1	7.2153
1981-82	1597.6	7.3763
1982-83	1781.3	7.4851
1983-84	2075.9	7.6382
1984-85	2313.4	7.7465
1985-86	2622.4	7.8718
1986-87	2929.5	7.9826
1987-88	3332	8.1113
1988-89	3957.8	8.2834
1989-90	4568.2	8.4269
1990-91	5355.3	8.5858

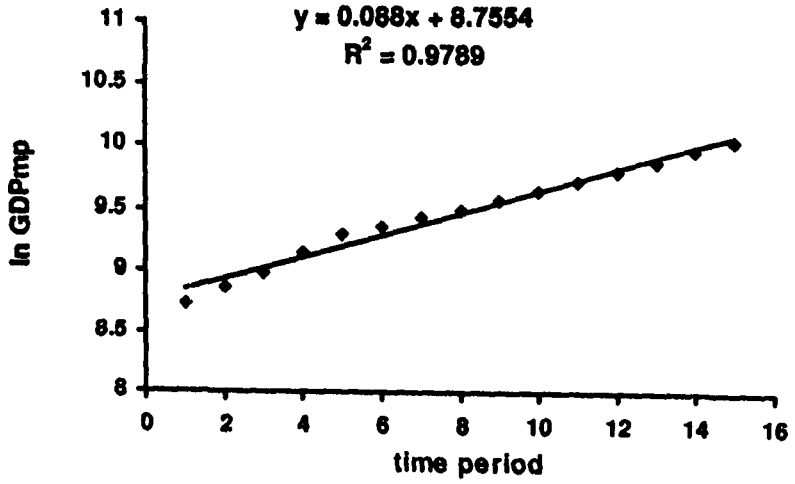


Intercept →7.0858
Regression Coefficient→0.133
Coefficient of Determination R-square→0.9973
⇒% CRG in GDPmp=(Antilog of Regression Coefficient-1)*100
=(1.1422-1)*100
=0.1422*100

=14.22

Table : 4.4 **Percentage CRG IN GDPmp after economic reforms**

year	GDPmp	ln GDPmp
1991-92	6168	8.7271
1992-93	7053.3	8.8613
1993-94	8010.3	8.9885
1994-95	9456.2	9.1544
1995-96	10884.1	9.2951
1996-97	11637.8	9.3620
1997-98	12437.7	9.4285
1998-99	13310.9	9.4969
1999-2000	14275	9.5663
2000-01	15371.4	9.6403
2001-02	16566.9	9.7152
2002-03	17898	9.7924
2003-04	19372.1	9.8716
2004-05	21013.4	9.9529
2005-06	22825.9	10.0357

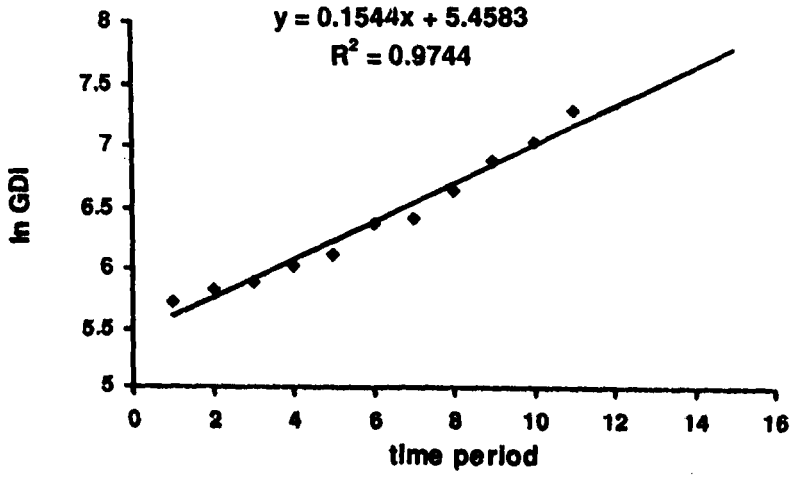


Intercept →8.7554
Regression Coefficient→0.088
Coefficient of Determination R-square→0.9789
⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100
= (1.092-1)*100
=0.092*100

=9.2

Table : 4.5 **Percentage CRG IN GDI before economic reforms**

year	GDI	ln GDI
1980-81	308.8	5.7327
1981-82	342.1	5.8351
1982-83	363.4	5.8955
1983-84	418.1	6.0357
1984-85	454.7	6.1196
1985-86	591.7	6.3660
1986-87	611.6	6.4161
1987-88	764.6	6.6394
1988-89	969.7	6.8770
1989-90	1138.2	7.0372
1990-91	1448.5	7.2783

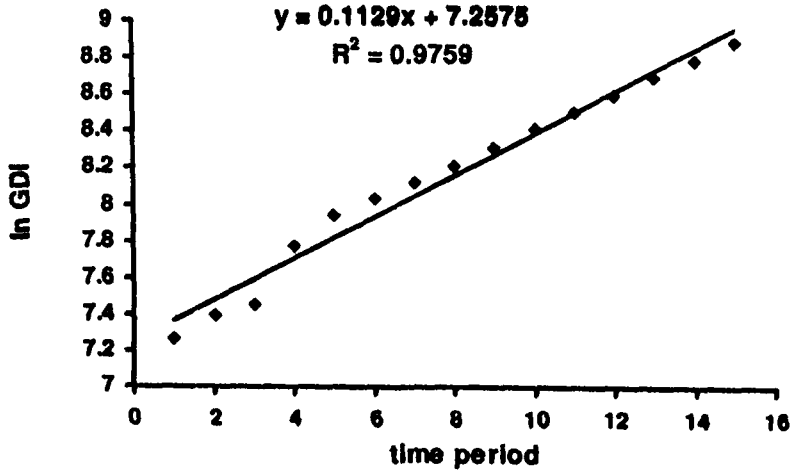


Intercept →5.3444
Regression Coefficient→0.1463
Coefficient of Determination R-square→0.974
⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100
= (1.1575-1)*100
=0.1575*100

=15.75

Table : 4.6 **Percentage CRG IN GDI after economic reforms**

year	GDI	ln GDI
1991-92	1440.2	7.2725
1992-93	1631.8	7.3974
1993-94	1733.3	7.4578
1994-95	2384.1	7.7766
1995-96	2825.5	7.9464
1996-97	3091.4	8.0364
1997-98	3391.1	8.1289
1998-99	3696.4	8.2151
1999-2000	4075.5	8.3127
2000-01	4512	8.4145
2001-02	4930	8.5031
2002-03	5415.3	8.5970
2003-04	5938.8	8.6893
2004-05	6523.4	8.7832
2005-06	7179.5	8.8790



Intercept →7.2575

Regression Coefficient→0.1129

Coefficient of Determination R-square→0.9759

⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100

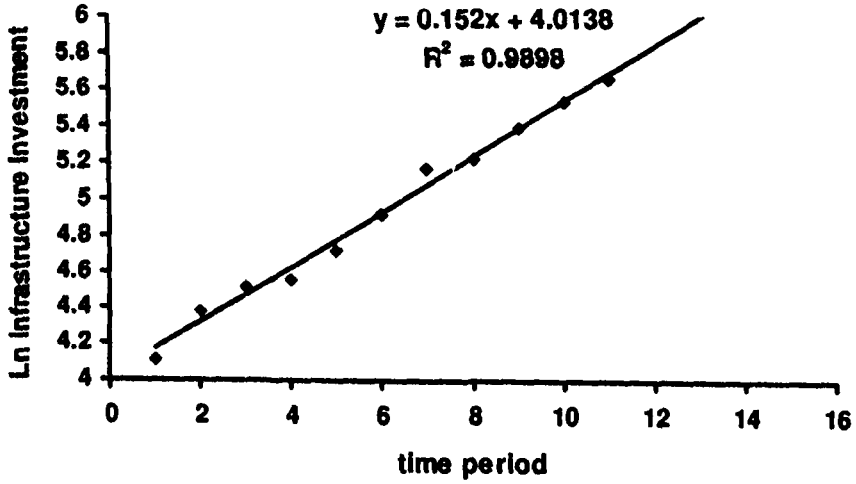
= (1.1195-1)*100

=0.1195*100

=11.95

Table : 4.7 **Percentage CRG in infrastructure investment before economic reforms**

year	infrastructure investment	ln (infrastructure investment)
1980-81	60.8	4.1076
1981-82	80.1	4.3833
1982-83	91.9	4.5207
1983-84	95.7	4.5612
1984-85	112.6	4.7238
1985-86	136.5	4.9163
1986-87	176.2	5.1716
1987-88	184.4	5.2171
1988-89	219.4	5.3909
1989-90	251.7	5.5282
1990-91	287.4	5.6609



Intercept →2.3965

Regression Coefficient→0.3358

Coefficient of Determination R-square→0.5305

⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100

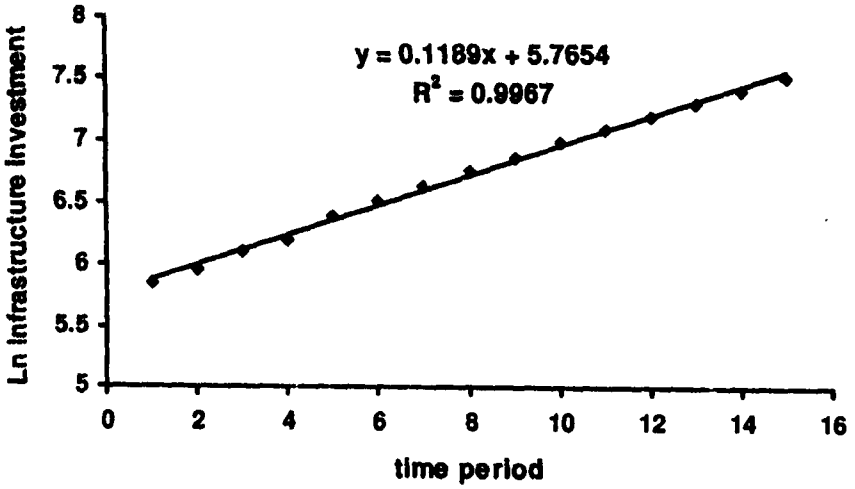
= (1.3991-1)*100

=0.3991*100

=39.91

Table : 4.8 Percentage CRG IN infrastructure investment after economic reforms

year	infrastructure investment	ln (infrastructure investment)
1991-92	350.5	5.8594
1992-93	387.3	5.9592
1993-94	452.2	6.1141
1994-95	494.1	6.2027
1995-96	598.6	6.3946
1996-97	675	6.5147
1997-98	758.7	6.6316
1998-99	852.4	6.7481
1999-2000	956.4	6.8632
2000-01	1076	6.9810
2001-02	1192.8	7.0841
2002-03	1324.5	7.1888
2003-04	1472.3	7.2946
2004-05	1639	7.4018
2005-06	1826.1	7.5099

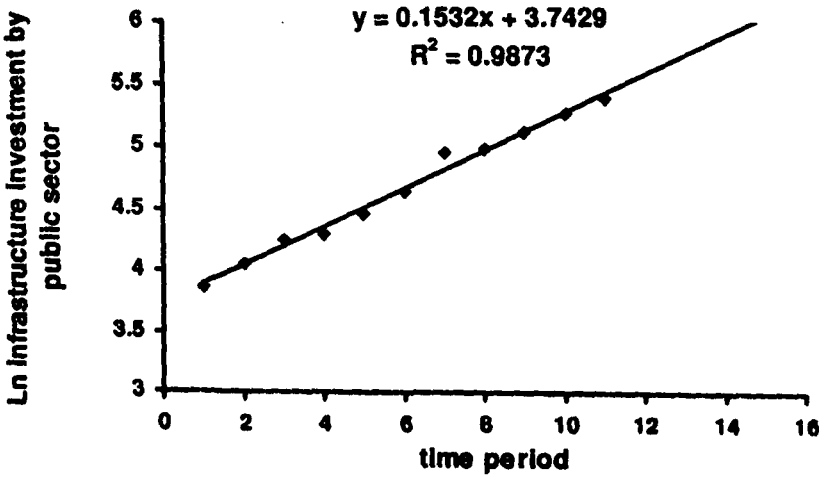


Intercept →5.7654
Regression Coefficient→0.1189
Coefficient of Determination R-square→0.9967
⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100
= (1.1263-1)*100
=0.1263*100

=12.63

Table : 4.9 **Percentage CRG in Infrastructure Investment (Public Sector) before economic reforms**

year	Infrastructure Investment(Public Sector)	ln [Infrastructure Investment(Public Sector)]
1980-81	47.7	3.8649
1981-82	58.3	4.0656
1982-83	70.3	4.2528
1983-84	73.2	4.2932
1984-85	86.3	4.4578
1985-86	104.1	4.6454
1986-87	142.3	4.9579
1987-88	145.2	4.9781
1988-89	167.1	5.1186
1989-90	193.5	5.2653
1990-91	217.3	5.3813



Intercept →3.7429

Regression Coefficient→0.1532

Coefficient of Determination R-square→0.9873

⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100

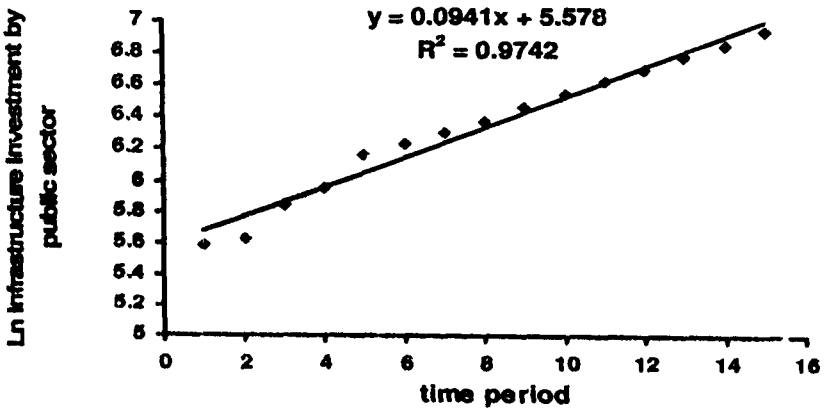
= (1.1656-1)*100

=0.1659*100

=16.59

Table : 4.10 **Percentage CRG in Infrastructure Investment (Public Sector) after economic reforms**

year	Infrastructure Investment(Public Sector)	ln [Infrastructure Investment(Public Sector)]
1991-92	266.5	5.5854
1992-93	278.4	5.6291
1993-94	346.9	5.8490
1994-95	387.1	5.9587
1995-96	477.4	6.1684
1996-97	511.1	6.2366
1997-98	546.3	6.3032
1998-99	587.2	6.3754
1999-2000	639.7	6.4610
2000-01	693.4	6.5416
2001-02	750.4	6.6206
2002-03	806.4	6.6926
2003-04	872.9	6.7718
2004-05	938	6.8437
2005-06	1019.4	6.9270

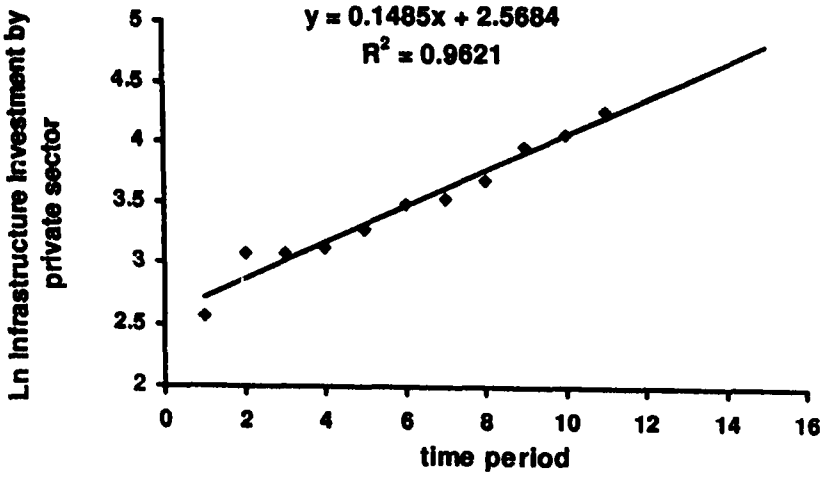


Intercept →5.578
Regression Coefficient→0.0941
Coefficient of Determination R-square→0.9742
⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100
= (1.0987-1)*100

=9.87

Table : 4.11 **Percentage CRG in Infrastructure Investment (Private Sector) before economic reforms**

year	Infrastructure Investment(Private Sector)	ln [Infrastructure Investment(Private Sector)]
1980-81	13.1	2.5726
1981-82	21.8	3.0819
1982-83	21.6	3.0727
1983-84	22.5	3.1135
1984-85	26.3	3.2696
1985-86	32.4	3.4782
1986-87	33.9	3.5234
1987-88	39.2	3.6687
1988-89	52.3	3.9570
1989-90	58.2	4.0639
1990-91	70.1	4.2499



Intercept →2.5684

Regression Coefficient→0.1485

Coefficient of Determination R-square→0.9621

⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100

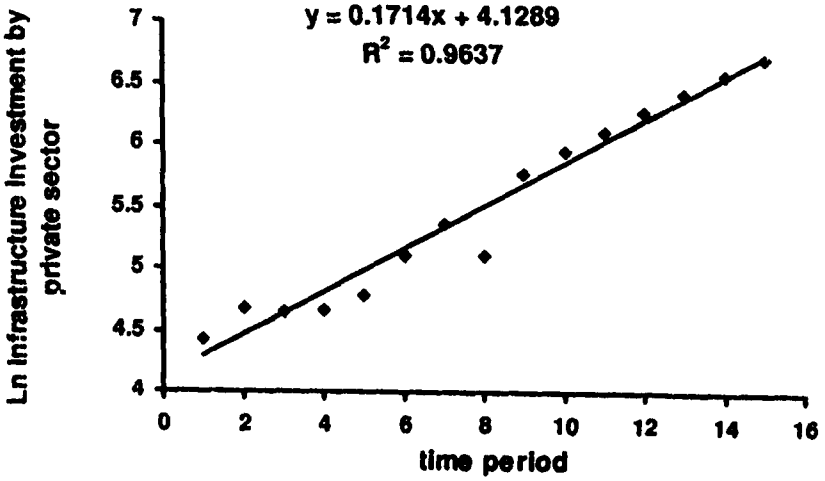
= (1.1601-1)*100

=0.1601*100

=16.01

Table : 4.12 **Percentage CRG in Infrastructure Investment (Private Sector) after economic reforms**

year	Infrastructure Investment(Private Sector)	ln [Infrastructure Investment(Private Sector)]
1991-92	84	4.4308
1992-93	108.9	4.6904
1993-94	105.3	4.6568
1994-95	107	4.6728
1995-96	121.2	4.7974
1996-97	163.9	5.0993
1997-98	212.4	5.3585
1998-99	165.2	5.1072
1999-2000	316.7	5.7580
2000-01	382.6	5.9470
2001-02	442.4	6.0922
2002-03	518	6.2500
2003-04	599.3	6.3958
2004-05	701.1	6.5527
2005-06	806.7	6.6930

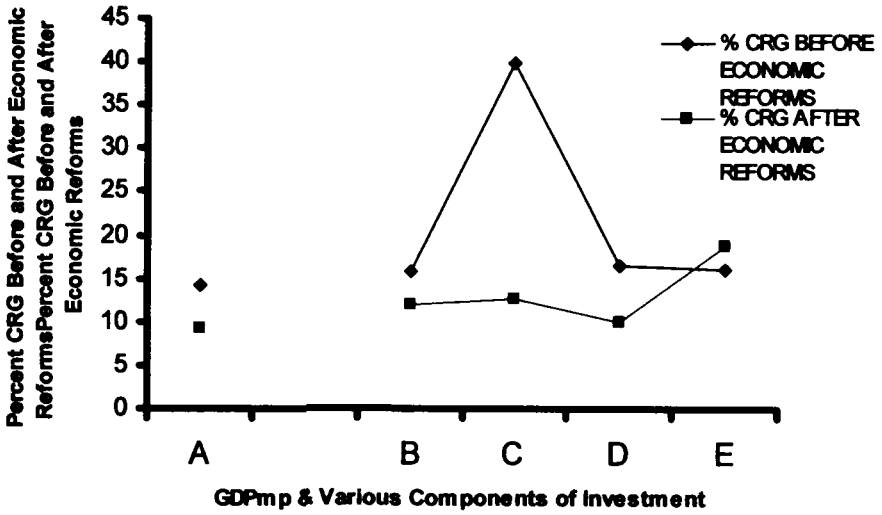


Intercept →4.1289
Regression Coefficient→0.1714
Coefficient of Determination R-square→0.9637
⇒% CRG in GDPmp= (Antilog of Regression Coefficient-1)*100
= (1.187-1)*100

=18.70

Table : 4.13 SUMMARY OF Percentage CRG OF DIFFERENT COMPONENTS BEFORE & AFTER ECONOMIC REFORMS

COMPONENTS	% CRG BEFORE ECONOMIC REFORMS	% CRG AFTER ECONOMIC REFORMS
GDPmp	14.22	9.2
GDI	15.75	11.95
Investment on Infrastructure Sector	39.91	12.63
Investment by Public Sector on Infrastructure	16.59	9.87
Investment by Private Sector on Infrastructure	16.01	18.70



*Here A → GDPmp
B→GDI
C→ Investment on Infrastructure Sector
D→ Investment by Public Sector on Infrastructure
E→ Investment by Private Sector on Infrastructure

Chapter V

INFRASTRUCTURE FINANCE AND INSURANCE IN INDIA

- INTRODUCTION
- FINANCING TRENDS
  - *CAPITAL MARKETS AND INITIAL PUBLIC OFFERS*
  - *PUBLIC PRIVATE PARTNERSHIPS (PPPS)*
  - *INFRASTRUCTURE FUNDS*
  - *BANK CREDIT*
  - *BONDS AND PENSION FUNDS*
- MAJOR PLAYERS OF INFRASTRUCTURE FINANCING
  - *WORLD BANK*
  - *ASIAN DEVELOPMENT BANK (ADB)*
  - *INFRASTRUCTURE DEVELOPMENT FINANCE COMPANY (IDFC)*
  - *ICICI BANK*
  - *INDUSTRIAL DEVELOPMENT BANK OF INDIA (IDBI)*
  - *INDUSTRIAL FINANCE CORPORATION OF INDIA (IFCI)*
  - *STATE BANK OF INDIA (SBI)*
  - *INDIA INFRASTRUCTURE FINANCE COMPANY LIMITED (IIFCL)*
- CONCLUSION

INTRODUCTION :

The development of an economy depends directly upon the availability of financial infrastructure facilities such as banking, insurance, etc. Banks facilitate in promoting the rate of savings and thereby help spending up the rate of capital formation. Different states are having the different levels of financial infrastructure which help in their economic development to a great extent.

Infrastructure projects are capital intensive and have long gestation periods. They face risks during pre-construction, construction and post-construction stages. The level of risk falls as the project matures. Therefore, factors such as strength and experience of promoters, clarity on government policies, tie- up resources/off take arrangements, contractual frame work, tax benefits, projects structuring, etc., play crucial roles. Infrastructure projects are financed through non recourse or limited recourse funding. There are many ways in which institutional investors, Indian or foreign, can invest in infrastructure. The participation can be direct or indirect, in equity or in debt, in the primary or secondary markets. The debt is financed mainly by Development Financial Institutions (DFIs), Multilateral Agencies, Domestic and Foreign Commercial Banks and Export Credit Agencies (ECAs). These agencies provide debt themselves and also help arrange loans from other sources. They also provide guarantees and play an advisory role. The key domestic financial institutions include the Industrial Finance Corporation of India, Industrial Development Bank of India, Life Insurance Corporation and Small Industries Development Bank of India. There are also niche institutions including the Infrastructure Development

Finance Company; The Power Finance Corporation and Rural Electrification Corporation for Power; and The Housing Development Finance Corporation for the Housing Sector. In India, the World Bank and the Asian Development Bank have been the most active in lending to infrastructure projects. The International Finance Corporation and The Japan bank for International Cooperation also provides loans to infrastructure projects. Banks are also increasing exposure in infrastructure. Prominent lenders include the State Bank of India and its associate banks, ICICI Bank, Punjab National Bank, Canara Bank, Bank of India, Union Bank of India. Allahabad bank, Oriental Bank of Commerce, Corporation Bank and Syndicate Bank.

FINANCING TRENDS:

Opportunities are increasing by the day as more projects are conceived, developed and commissioned. The options are also becoming more complicated as financing structures evolve. According to planning commission estimate, India needs investment of about $492 billion (until the end of 2011-12) for its infrastructure requirements and close to $145 billion of that will have to come in from private investors. The reform and liberalization process has, to a great extent, been dictated by the need to attract that investment and indeed, infrastructure has emerged as an attractive asset class for both Indian and Foreign investors.

Some of the key trends in infrastructure finance are –

Capital Markets and Initial Public Offers:

Ability of Infrastructure companies to tap the equity markets to fund capital requirement has been observed as the most significant trends. Equity is a superior financing root in the Indian context since secondary equity market are much better developed than debt market, offering greater liquidity. It is estimated that during 2006-07, about 20 Infrastructure companies tapped capital markets and raised about Rs168.54 billion through Initial Public Offers (IPOs). This marked an increase of 230 per cent over the amount raised by 16 infrastructure companies in 2005-06.

Public Private Partnerships (PPPs):

Another most significant trend has been the emergence of public-private partnerships (PPPs) as a viable source of project funding. PPPs allow for better risk allocation, faster implementation, reduced costs, improved quality of service and enhanced public management. Sector-wise PPPs in India have mostly been prevalent in the transportation sector, According to finance ministry, since August 2006, 29 projects worth Rs 180.29 billion have been given final approval under the PPP route. While 23 of these projects are in the roads sectors, six are in the ports and shipping sector. The aviation sector is also witnessing increased PPP activity. At present, four airport projects – Delhi and Mumbai modernization projects and Bangalore and Hyderabad Greenfield airport projects – are being implemented on PPP basis.

Infrastructure Funds:

The opportunities in the infrastructure segment have led many domestic and foreign institutions to set up infrastructure funds. These funds typically provide equity and debt financing with exposure at the corporate level or at the projects level. India Infrastructure Finance Initiative (IIFI) was created by citigroup, blackstone, Infrastructure Development Finance Company (IDFC) and India Infrastructure Finance Company Limited (IIFCL) with a corpus of $ 5 billion. The fund will deploy $ 2 billion in equity and $ 3 billion in long-term debt financing, with maturities exceeding 10 years. Funds on the lines of IIFI have been launched by the State Bank of India with a corpus of $ 1 billion. IDBI Limited and the Life Insurance Corporation have also formed a strategic alliance to fund infrastructure projects through joint and take-out financing for long gestation projects. The government also announced the India Infrastructure Project Development Fund (IIPDF) in the 2007-08 budget. The fund has an initial corpus of Rs1 billion. IIPDF will finance up to 75 per cent of project development cost as interest – free loan to be recovered from the successful bidder with "return". With the growing opportunity in the infrastructure sector, a number of theme-based mutual funds that invest in infrastructure companies are also coming up.

Bank Credit:

After the relaxation in norms by the RBI banks are also increasing their exposure in infrastructure. During financial year 2006-07, commercial banks' outstanding exposure to the infrastructure sector was Rs 1,429.75 billion. Of this, the power

sector accounted for the majority of the shares at 50.9%, followed by roads and forts at 17.4% and telecom at 13.6%. Commercial banks' outstanding credit to the infrastructure sector has grown at a compounded annual rate of 35.3 per cent since 1999. The trend of funding projects through a consortium of banks has also become prevalent as it results in the sharing of risks. However, commercial banks continue to be plagued by issues of asset-liability mismatch, sector-wise caps and prudential limits that hobble exposure to infrastructure. External Commercial Borrowings (ECBs) are also an important source of infrastructure finance. It is estimated that in 2006-07, Rs 176.35 billion was raised by the corporate sector for infrastructure projects through ECBs. However, the RBI has imposed more restrictions on foreign funds flows for rupee expenditure and interest rates have risen due to the U.S sub-prime crisis.

Bonds and Pension Funds:

Apart from equity and bank credit, bonds are sources of infrastructure finance. In India, bonds are issued by way of government borrowings and through private placement and the issue of commercial paper. According to industry sources, about Rs 2,319.5 billion was raised through bond issues during 2006-07. Of this, government borrowing accounted for 65 per cent, private placements for about 39 per cent and the rest was constituted by commercial paper. Over the years, private placement has become increasingly popular. Figures indicate that while the share of private placement increased by almost 42 per cent from 2004-05 to 2005-06, the share of government borrowings increased by about 36 per cent.

The share of corporate debt or commercial paper has been quite low. Pension and insurance funds are slowly gaining ground but are yet to become popular as insurance companies are often not able to invest due to rating constraint. Public sector companies National Highways Authority of India (NHAI) and Rural Electrification Corporation (REC) are allowed to issue tax-free bonds, in the year 2006-07, the NHAI issued bonds worth Rs 35 billion. REC also received government approval to issue bonds worth Rs 35 billion to fund the supply of power to villages in the next three years. However, a lot needs to be done to develop the corporate bond markets and channelise pension funds into long-term infrastructure projects.

MAJOR PLAYERS OF INFRASTRUCTURE FINANCING:

Infrastructure financing has largely been the domain of government funding and multilateral institutions such as the Asian Development Bank (ADB) and the World Bank. With reforms leading to acceleration in the pace of infrastructure development, more players are now offering low-cost funds with high maturity profiles. The growing popularity of universal banking and relaxations in norms by the Reserve Bank of India has encouraged commercial banks to take significant exposures in infrastructure. The lending of commercial banks to infrastructure has grown at a compounded annual rate of 35.3 per cent since 1999 and reached 1,429.75 billion as on March 2007.

The list of prominent financiers now include the Infrastructure Development Finance Company (IDFC), Industrial Development Bank of India (IDBI), Industrial

Finance Corporation of India (IFCI), State Bank of India (SBI) and Life Insurance Corporation (LIC). Apart from these, sector-specific institutions such as the Power Finance Corporation and Hudco and other financial institutions like SIDBI and IL & FS have also become more aggressive.

Commercial banks such as Punjab National Banks, United Bank of India, Canara Bank, Oriental Bank of Commerce, Bank of Baroda, Bank of India, Corporation Bank, Syndicate Bank, Dena Bank, Indian Bank, Indian overseas Bank, Union Bank of India, Central Bank of India and Allahabad Bank have also increased exposures to infrastructure. Several foreign banks have also entered the arena.

The key players of infrastructure financing and insurance are –

WORLD BANK

The World Bank is the largest multilateral funding agency in India. It provides low-cost, long-tenor financing to infrastructure projects through loans under its International Development Assistance and International Board for Reconstruction and Development policies. The Bank also provides technical assistance for undertaking feasibility studies of projects.

As of June 30, 2007 there were 67 active World Bank projects in India with total commitments of about $14.3 billion. In financial year 2006-07 (July-June), the Bank made new commitments to the tune of $3.7 billion. This marked an increase of 164.28 per cent over commitments in 2005-06.

The world Bank is a major investor in the transportation sector of India. At present, the Bank's total commitments for the transport sector are $4.95 billion. It

has provided 17 loans for improvement of national highways and state highways and 18 loans for railways.

The multilateral agency has also begun to focus on energy. Recent data released by the Bank indicate that out of the total lending of $729 million since June 2007, the share of the energy sector was the highest at 63 per cent.

Recently, the World Bank supported the restructuring of West Bengal's state electricity board by providing a soft loan of Rs 70 million and approved $400 million loan to Satluj Jal Vidyut Nigam Limited for the 412 MW run-of-the-river Rampur hydro projects in Himachal Pradesh. It is also supporting the expansion program of Power Grid Corporation of India Limited and has sanctioned loans for several road projects in Himachal Pradesh, Orissa and Tamil Nadu during 2007.

The Bank's private equity arm, the International Finance Corporation, also had a portfolio of over $2,117 million (June 30, 2007), which was an increase of 68 per cent over the previous year.

ASIAN DEVELOPMENT BANK (ADB)

ADB has also been an active player in infrastructure financing. The multilateral agency has been providing support to India in the form of policy dialogue, loans, technical assistance, grants, guarantees and equity investments.

At the end of December 2006, ADB had extended loans worth $10,606.2 million towards infrastructure projects constituting about 64.5 per cent of ADB's lending to India. Of the total loans extending to infrastructure, 29 loans were to the energy sector aggregating $5,125.8 million, 24 loans to the transportation and

communication sector aggregating $4,979.2 million and 3 loans aggregating $501.2 million for water supply and sanitation projects.

ADB provided a loan of $75 million to NTPC to fund the Sipat super thermal plant in Chattisgarh and the Kahalgaon super thermal plant in Bihar and approved a loan of $620 million for the Madhaya Pradesh power sector in April 2007. It also provided a $320 million loan and $1 million technical assistance grant to the Madhaya Pradesh government to improve the state road network and has also funded the expansion program of Petronet LNG Limited. The multilateral agency is also planning to fund the 4000 MW Mundra Ultra Megha Power project being developed by Tata Power Company (TPC).

INFRASTRUCTURE DEVELOPMENT FINANCE COMPANY (IDFC)

IDFC was incorporated on January 30, 1997 as a specialized institution to facilitate flow of private finance to commercially viable infrastructure projects. It provides assistance by way of debt and equity support, mezzanine structures and advisory services.

As on March 31, 2007, IDFC's exposure to infrastructure projects was Rs 220.4 billion. Of this, the energy sector accounted for the highest share at 39 per cent, followed by transportation at 27 per cent, telecom and information technology at 17 per cent, industrial and commercial at 14 per cent and others at 3 per cent.

During 2006-07, IDFC approved loans worth Rs 130.53 billion for various infrastructure projects, of which around 55.2 per cent was disbursed. Os the outstanding disbursements, 2.5 per cent was as equity while a major share (92

per cent) was as loans. IDFC has set up the India Development Fund with an initial corpus of Rs 10 billion. The fund invests in the equity of infrastructure projects.

Recently, it has launched $5 billion initiatives in association with Citigroup, Blackstone and IIFCL for financing infrastructure projects in India. Of this $2 billion will be deployed as equity capital, while the remaining the $3 billion will be raised through long-term debt with maturities exceeding 10 years. IDFC has initially invested $25 million in equity for the fund.

ICICI BANK

ICICI is the largest Indian private sector bank. As on March 31, 2007 it had loans and advances of Rs 1,981.9 billion. Of this, about 7.1 per cent was in various infrastructure sectors. However, the share of the infrastructure sector declined as a percentage of total advances from 12.32 per cent in 2005 to 7.14 per cent in 2007.

In 2007, the exposure to the power sector was 2.1 per cent of total advances as compared to 1.8 per cent in 2006. As on March 31, 2007, the total advances to crude petroleum/refining and petrochemicals were Rs 48.57 billion, power Rs 41.28 billion, roads, ports, telecom and urban infrastructure Rs 29.87 billion and electronic and engineering Rs 21.86 billion.

Some of the projects financed by ICICI bank during 2007 include Raj West Power Limited, where the bank syndicated Rs 36.75 billion as a lead banker of a consortium. It also led the financial closure of the Teesta VI hydro project and

was appointed lead arranger for Delhi International Airport Limited. It was also part of the consortium that funded the UB Group's acquisition of 46 per cent stake in Deccan Aviation.

The bank is in the process of setting up a $2 billion infrastructure fund.

INDUSTRIAL DEVELOPMENT BANK OF INDIA (IDBI)

IDBI is amongst the largest commercial bank in India. In July 2004, it received board approval for conversion into a bank, which gave it greater operational flexibility and lower funding costs. IDBI provides project finance in both rupee and foreign currencies for green field projects, as also for expansion, diversification and modernization.

Most of IDBI's advances are for the power and telecom sectors. As on June 30, 2007, IDBI's exposure to power generation was 8.14 per cent followed by telecom as 5.8 per cent as a percentage of total industry exposure. Apart from these, it also lends to other infrastructure sectors including airports, ports and highways.

IDBI has participated in financial closure for a number of projects. Its recent power projects include the 1,015 MW Nagarjuna project where IDBI contributed Rs 880 million, the 1000MW Raj West power project and the 330 MW ShriNagar hydro power project. It also syndicated debt for the 1,200 MW Rosa project for around Rs 20 billion.

IDBI also led the consortium for financing of Mumbai International Airport Limited and Dhamra Port Company Limited. It also syndicated debt of Rs 30 billon for

Idea Cellular Limited and led the consortium for financing Kundli-Manesar-Palwal Expressway Limited, a special purpose vehicle executing the Rs 19.15 billion Kundli-Manesar-Palwal expressway limited.

INDUSTRIAL FINANCE CORPORATION OF INDIA (IFCI)

IFCI is amongst several financial institutions set up to promote development in India. Infrastructure is the largest recipient of IFCI's largesse.

As on March 31,2007, IFCI's net outstanding in the infrastructure sector amounted to Rs 14.02 billion. This accounted for 16.1 per cent of IFCI's total outstanding.

IFCI's net outstanding to the infrastructure sector, however, declined from Rs 16.82 billion in March 2006 to Rs 14.02 billion in March 2007. This is in line with its strategy to avoid fresh commitments and monitor its portfolio stringently.

Sector-wise, power accounts for almost 66 per cent of the net outstanding. The rest is divided between the port, telecom and other infrastructure sectors. Some of the projects financed by IFCI in the past include the 355 MW Lanco Kundapalli project in Andra Pradesh and the 655 MW Gujrat Paguthan Energy project. It has also lent to Adani port in Gujrat and the Noida Toll Bridge project.

Currently, IFCI in the process of selling a 26 per cent strategic stake for which it has invited expressions of interest for different investors. Such a move is likely to instill confidence in the institution.

STATE BANK OF INDIA (SBI)

SBI set up a specialized unit called the Project Finance Strategic Business Unit (PFSBU) in 1995 to deal with infrastructure lending. PFSBU handles projects with a project cost of over Rs 1 billion. Th proposed share of SBI in the term loan is required to be more than 500 million and in the case of road sector projects, the cut-offs are Rs 500 million for project cost and Rs 250 million for SBI's term loan.

During 2005-06, PFSBU extended sanctions to 18 projects worth over Rs 40 billion. This is significantly higher than its 2004-05 exposure, when the unit sanctioned 13 projects at costs exceeding Rs 25 billion. Apart from the sanctions, the unit also arranged or tied up Rs 70 billion of debt either by itself, or in conjunction with its associate banks.

Since 2006, SBI has provided a loan of Rs 17 billion to the Damodar Valley Corporation to fund its expansion program. It also led the financial closure of JSW Energy's 1,200 MW coal-based power project at Ratnagiri. It also participated in refinancing a $950 million bridge loan facility taken by TPC to acquire 30 per cent stake in Indonesia's PT Kaltim Prima Coal and PT Arutmin. The bank also lend $25 million to Great Eastern Energy Corporation Limited and funded the expansion program of Air India, Mundra Port and Special Economic Zone Limited, Suzion Energy, Petronet LNG and Gujrat State Petroleum Corporation.

In the future, SBI is looking to set up a $1 billion infrastructure fund, which will invest in both domestic and overseas markets.

INDIA INFRASTRUCTURE FINANCE COMPANY LIMITED (IIFCL)

IIFCL was formed in January 2006 as a hundred per cent government-owned infrastructure financing SPV. The SPV funds infrastructure projects for up to 20 per cent of the total project cost.

IIFCL funds commercially viable projects through long-term debt, refinancing banks and financial institutions for loans of tenor longer than 10 years, or of any other form permitted by the union government. Its tenors normally extend up to 10 years.

The company has entered into strategic partnership with 3i Group of the UK, IDFC, IL&FS and 18 other banks and financial institutions to facilitate equity and debt support for infrastructure projects. IIFCL has also set up a debt fund of $3 billion. Further, IIFCA has set up an equity fund of $2 million with IDFC, Citigroup and Blackstone, where it has contributed $25 million.

Cumulatively, till November 30, 2007, IIFCL has approved financial assistance of Rs 163.81 billion to 71 infrastructure projects at an investment of Rs 1,97.90 billion. The highest number of loans were sanctioned for the power sector at Rs 197.37 billion, followed by roads and airports at Rs 41.80 billion and Rs 21.50 billion respectively.

IIFCL also proposes to set up an overseas subsidiary in London or Singapore to utilize forex reserves for financing infrastructure projects.

During 2007-08, IIFCL expects to sanction loans worth Rs 150 billion to the infrastructure sector and plans to increase it to Rs 800 billion over 2007-11.

CONCLUSION:

In low income economies like India, innovative and diverse financing techniques like setting up of infrastructural development bank, creation of infrastructure bond, development of domestic capital market, privatization, promotion of contractual savings etc., are needed to support an accelerating transition from public sector to private sector in the provision infrastructure sector. The five year plans in India have devoted considerable attention and earmarked between 55 per cent and 63 per cent of the total plan outlays on infrastructure development which have brought about substantial increase in these facilities. But still because of the poorly targeted subsidies and managerial inefficiency in the public sector critical infrastructure goods and services are under provided thereby choking development process. Unless the capacities are augmented and operational efficiencies improved, the infrastructure sector would be under greater strain. There is critical need to attract investment in infrastructure. An investor is interested in a transparent system, consistent policy and a situation where the public and private sectors equally competitive. To attract the kind of investment required there is urgent need for clarity in policy, regulating and administrative roles and responsibilities.

Chapter VI

SUMMARY

AND

CONCLUSION

Summary and Conclusion:

Throughout the study we find that infrastructure is defined as capital of society or social capital that is embodied in such forms as help direct productive activities. The forms in which this capital is found are transport and communication, power etc. Broadly, the nature of the infrastructural installations is that these do not produce commodities directly. These are in the nature of facilitative set-up that promotes general economic activities. As such it is also known as social overhead capital. Infrastructure is of great importance for an economy. India has rightly given it a high priority in its various plans. And much progress too has been recorded in this field. The importance of infrastructure has been recognized right from the beginning of planned development in the early fifties. Particular attention has been devoted to such sector as transport, communication, energy etc. These sectors have been allotted large resources, and considerable efforts have gone into their expansion and modernization.

Since the basic infrastructure has to be big sized if it is to render services, large investments have been made in it. For example, to provide transport services of various types, big investments have gone into the making of rail tracks, roads, ports and harbor, air terminal etc. This investment can not be of small size, nor can these be varied in a small size. This is again an irreducible mix of public utility services which must be set up to reap its benefits. These facilities yield returns or benefits over long period of time only if these are set up in their proper sizes which are massive indeed. The investment needs for these facilities have been estimated to be in the range of 30-40 per cent of the total

investment of a developing country. Indians plans have devoted resources of this magnitude all through these years. Taking only transport and communications and power, the proportion of outlay of the total in each plan has been above 35% and in at least three plans much nearer to 40% mark. If one takes note of investment in other facilities of similar nature, the ranking of infrastructure in India's development plans will be still higher.

In any developing country, there is need for giving high priority to the development of infrastructure facilities as it has been greatly felt that the expansion of these facilities is an essential pre-condition for general economic development. Indian planners have high priority for the expansion of energy, transport, communication and banking. But still infrastructure remain the biggest stumbling block to economic development. Unfortunately, our bureaucratic model has failed to undertake an integrated approach to infrastructure development particularly in energy sector in India.

Would infrastructure is a condition for acceleration economic growth. It increases productivity, lowers production costs, raises a country's international competitiveness, as well as its ability to attract international funds. It delivers major benefits in terms of poverty elevation and environment sustainability. Growth of infrastructure is a basic source of economies leading to reduction in production costs and increase in Gross Domestic Product (GDP). The study suggests that growth of infrastructure has a high potential pay off in terms increase in Net State Domestic Product (NSDP). So, the reforms in the provision of infrastructural services are a must.

Since independence India has ever given its infrastructure a high priority. In Ninth Plan also there is a special emphasis on infrastructural facilities. Despite all is not well with the infrastructural facilities at present; its small size is one of the important weaknesses compare to its needs.

There is an evolutional growth of infrastructure before independence. Railway, irrigation, post and telegraph sector were somewhat partially developed before independence. But after 1947, there are bright trends of infrastructure development. But it is not satisfactory. Since 1991, we concentrated in infrastructure development. But still there are many crucial problems.

After the New Economic Policy both private and foreign sectors are fully in the operation in the Indian economy. The matter is that infrastructure is still the responsibility of the government sector. The shortages of the infrastructure and lower rate of investment and underproduction of goods and services relating to infrastructure have become the main cause of concern for the economic planners, thinkers and as well as economic administrators. Taking them into account government had constituted Rakesh Mohan Committee on infrastructure.

External capital inflows perform an important role in the financing of investment on infrastructure sector in India. The Indian capital market is partially open to investments by 'Foreign Institutional Investors' (FIIs) within prescribed limits. High growth in trade is absolutely essential if India is to attract external capital inflows of the volumes desired and on a sustainable basis.

In India, the quality and quantity of infrastructure services are very poor and there exists a wide gap between its demand and supply. The government expenditure in real terms on infrastructure sector has declined substantially since 1991. The fiscal constraints of the government has given support to the new thinking of withdrawal of the state ownership and control of infrastructure activities and this role is left to private investors with incentives and other support provided by the government. Since the onset of the economic liberalization strategy in 1991, the government of India has taken initiatives and given numerous financial crutches to attract and facilitate private investment in this area. The procedure relating to foreign investment in the infrastructure sector has been liberalized. But the performance of the infrastructure sector has not improved during the period of post economic reform in comparison with the period of pre-economic reforms, and adverse effects are evident in the performance of key infrastructure industries (chapter 4).

As the government's ability to undertake investment in infrastructure is constrained, private participate has become necessary. But the transmission from public sector to private participation is not smooth. In my study I have attempted to describe the role of private sector as providers of infrastructure services in India. The objective is to study whether infrastructure provided by private sector is adequate or not to foster the rate of economic growth. Considering the profit motive of the private sector, there is no guarantee that the private sector would invest in infrastructure areas in future which are both risky and less profitable.

We find that arbitrary and restrictive legal norm, price and tariff controls, the huge cost involved and the absence of a transparent regulatory framework work as a block to the entry of private sector in infrastructure industries. Clear stable non-discriminatory rules within a framework of competition and economic freedom can resolve many critical issues of infrastructure and make private participation easy and effective.

Acceleration in economic growth at the rate projected will clearly not be possible to achieve without a corresponding acceleration in the rate of investment in infrastructure. Higher industrial growth will require substantial new investment in power, transport and communication etc.

The main aim of economic development is to provide comforts and decencies of life to the human beings and make human living happier. Economic development is said to be achieved only when the present generation are fully equipped with all basic needs not at the cost of future generations. Social infrastructure makes the country's manpower more efficient, qualitative and productive. Education, training, health and medi-care, social security, insurance and various other civic amenities are parts of social infrastructure. In economic development, apart from agriculture, industrial development depends on Human Resource Development. Proper utilization of human resources provides the key to the economic and social development. The real wealth of a country lies in the development and effective utilization of human productive capacities. Human capital is one of the most crucial instruments of development.

Education plays the most important role in developing human capital at every stage of development.

Just as investment in physical infrastructure forms a pre-requisite for the purpose of growth, the very progress in this sector requires a strong social infrastructure consisting of rich human resources. Most nations with successful stories of economic growth have realized the role of this sector and invested a substantial percentage of their GDP for social sector.

India is on move towards becoming a world economic power and Asian tiger through rapid industrialization. India also actively participated in the globalization process. We have to compete with China, Taiwan, and Indonesia in global market. In future we should concentrate in sound organization in the infrastructure sector.

As we know that economic development mostly depends on infrastructure sector. Development of infrastructure contributes to agricultural development, includes industrialization, encourages trade and mobility of lobar. The scale of industrial production largely depends on the level of the development of infrastructure. Infrastructure facilities and economic growth are related. Infrastructure development can have significant impact on economic growth. Adequate quantity, quality and reliability of infrastructure are key determinants of the growth of the overall economy.

Infrastructure is a very important element for economic growth of a country. The poor countries in all regions have poor infrastructural set up. The stress on infrastructure is nothing new. All around development of a country depends

largely on its infrastructure. It is a big canvas – rather it is like an umbrella which includes a lot of things. There are problems of finance, profitability, administrative hurdles, mismanagement, misdirected planning and implementation etc. we have adopted wrong path of development which creates infrastructure crisis. We should think in our Indian context. There is a need to change in whole strategy, direction and nature of economic development. We should over infrastructure-less or less infrastructure-oriented development strategy through decentralized industrial development by tiny, cottage, rural and agro-based industries.

The urgency to broaden and deepen domestic capital markets should be realized and necessary institutional changes should be brought about so that the flow of fund to finance infrastructure is kept uninterrupted to ensure efficiency of operation.

Development of all types of infrastructure is not likely to be financed by private investors alone. For instance, expenditure on rural roads, sewerage and sanitation etc., are unlikely to be covered by user charges. Governmental support by way of one-time grant of capital or land or both is indispensable. Besides that public private partnerships are also needed to stimulate the private finance. To eliminate the risk arising out of fluctuations in demand which is generally experience in power sector, government's guarantee – that users honor their purchase agreement – is most essential. It, therefore, transpires that even when domestic capital market is adequately developed, investment in infrastructure is not automatic. Without major involvement of the government at

almost all stages – in provision, operation and marketing – the investment in infrastructure, in private hand, is sure to fall short of requirement.

Now, as a concluding remark I would like to mention a few lines which are quoted by a famous economist – "A man in a particular region is poor because he has low income. He has low income because there is low economic activity. The reason for low economic activity is low potential capability for income generating activity. There is low potential capability because of low infrastructural development. And the reason for infrastructural development is that flow of investments (both public and private) is concentrated in limited regions given total funds for the nation as a whole."

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